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USSR Report

ENERGY

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UDC 621.643.002.2

MINISTRY OFFICIAL REVIEWS OIL INDUSTRY DEVELOPMENT DURING 1984

Moscow STROITELSTVO TRUBOPROVODOV in Russian No 2, Feb 85 p 4

[Article by A. P. Yermakov, Oil Industry Administration, Ministry of Construction of Oil and Gas Industry Enterprises: "For Development of the Oil Industry"]

[Text] The four years of the Eleventh Five-Year-Plan period have seen Minnefte-gazstroy [Ministry of Construction of Oil and Gas Industry Enterprises] complete major projects involving the construction of oil and gas pipelines, stations for pumping water into oil- and gas-bearing formations, compressor stations, pressure and group pumping stations, oil preparation facilities and water intake units. Some 12,000 km of oil and gas trunk line were built for Minnefteprom [Ministry of the Oil Industry]. The critically important Surgut-Polotsk oil pipeline was brought on line at design capacity. The result has been to give Western Siberian oil its entry into the central part of the country, Belorussia and the Baltic.

By bringing the Groznyy-Baku and Pavlodar-Chimkent trunk lines and the second section of the Krasnoyarsk-Irkutsk oil pipeline on line we eliminated the need for those 3500-kilometer railroad hauls, which has in turn made it possible to free up some 4150 tank cars for other uses within the national economy.

We have also seen additions to the network constituting our cheapest form of oil transport, the pipeline. We have now provided Western Siberian oil with access to oil refineries in the Northern Caucasus, Azerbaijan, the republics of Central Asia and in Eastern Siberia.

For a long time we had to move our oil from Shaim by pipeline to Tyumen and then by rail to the refinery in Volgograd. When we brought the Tyumen-Yurgamysh oil pipeline into service we were able to cut 1400 km off the rail haul.

Two more pipelines into Perm began to bring more oil to the refinery there and once again shorten the rail haul.

With the objective of transporting a broad fraction of light hydrocarbons from Western Siberia to customers in the Urals and along the Volga we completed line work during the course of 1984 on a special product line extending 1456 km. What we have to do now is to complete the major task of drying out the inside of it and then filling it with product.

Work is currently nearing completion on an oil pipeline extending from Western Siberia to the European part of the country, which will eliminate the problem of transporting oil out of Western Siberia for many years.

To achieve the objective of increasing oil production at planned rates, over the course of the first four years of the Eleventh Five-Year-Plan period Minnefteprom and Minneftegazstroy workers brought 120 new oil fields into production. They have also met targets for bringing a number of the most important field facilities into operation: group and high-pressure pumping stations and the gas-lift compressor stations. Last year, 1984, saw us exceed targets for bringing high-pressure and group pumping stations in line.

This year will see oil and gas industry builders faced with no less difficult challenges in the effort to develop the country's oil industry. During the first year alone we are going to have to concentrate basic material and manpower resources in the Tyumen region and develop and bring on line 15 new fields in this oblast over and above the number called for in the plan.

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OIL AND GAS

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DEVELOPMENT OF NEW OIL AND GAS DEPOSITS OUTLINED

Moscow STROITELSTVO TRUBOPROVODOV in Russian No 2, Feb 85 pp 2-4

[Article by M. Kh. Khusnutdinov, USSR deputy minister of oil and gas industry enterprise construction: "The Development of New Oil and Gas Deposits," "Implement Decisions of the 26th Congress of the CPSU"]

[Text] Basic Directions of the Economic and Social Development of the USSR for 1981-1985 and the Period up to 1990 calls for the formation of new industrial regions for the production and processing of gas, condensate and oil and the production of chemical products in regional facilities.

The high content of condensate, hydrogen sulfide, ethane and other valuable chemical components is a characteristic feature of the new oil and gas fields in the Caspian Basin. Forecasts are saying that the reserves of oil, gas and condensate in this oil- and gas-producing province of the country are substantial. Despite the difficult geological and geophysical conditions this region presents, a region characterized by deep-lying producing horizons and unusually high formation pressures, the past few years have seen an extensive program of geological exploration carried out here. In the development of these deposits and the construction of field facilities, a great deal of attention is being given to measures designed to protect the natural environment.

The development of deposits in the Caspian Basin is contributing to advances in fuel power engineering and the chemical industry and to efforts to implement the food program. One of the particularly attractive features of these deposits is the short time it takes to recoup the capital investment in the development due to their proximity to industrial centers. The fields we are talking about would include the Tengiz oil and the Astrakhan gas condensate deposits in the Caspian lowland, a group of deposits in Turmeniya, deposits such as Gugurtli, Uchadzhi and Shurtan in Uzbekistan and the Zhanazhol oil and Karachaganak gas condensate deposits in western Kazakhstan. Organizations of the Ministry of Oil and Gas Industry Enterprise Construction together with the Ministry of the Petroleum Industry, the Ministry of the Gas Industry and other ministries and departments are scheduled to build new oil and gas production facilities in this regions.

The Tengiz oil field is in the southeastern part of the Caspian lowland and belongs administratively to Embinskiy Rayon in Guryev Oblast. The soil and vegetation in the vicinity of the field are of the solonchak variety; the climate

is markedly continental. The absolute maximum temperature is 44 °C, the absolute minimum -36 °C; wind speeds can reach 28 m/s. Ground water can be found at depths ranging between 0.5 and 4.0 m. It has a high mineral content and is salt water of the sodium-chloride variety, which will corrode cement very quickly. Within the general vicinity of the field there are no sources of water for either drinking or industrial purposes.

The aggressiveness of the components of the oil from the Tengiz field requires field facilities of a particularly high degree of reliability.

Oil prepared for transport from the field here feeds to the Prorva-Tengiz-Kulsary oil pipeline, the petroleum gas into the Tengiz-Kulsary gas pipeline and then the system linking Central Asia with the Center.

In view of the fact that the field here is in an undeveloped region a considerable distance from centers of the construction industry, the development of the field began with the building of roads, external communications for the engineers and auxiliary operations buildings and housing in the settlement of Kulsary and Guryev. On the immediate agenda now is the task of opening up the railroad and a road for motor vehicle traffic. Still to be completed are the Tengiz-Kulsary gas pipeline, the Prorva-Kulsary oil pipeline and a line to bring in water for operational purposes.

Work is now under way on the organization of operations in the Tengiz field. Plans call for the formation and permanent assignment of construction organizations in Embinskiy Rayon and the establishment of the necessary construction bases.

The Zhanazhol oil field is very favorably located relative to major consumers of both oil and gas, which offers the hope that it can be brought into production fairly quickly. The field is situated in a plain in the foothills. Here, too, the climate is markedly continental, the maximum air temperature reaching 42 °C, the minimum -39 °C.

The first section of the field has already been brought into production along with all the necessary supporting facilities (separators, oil desulfurization and sulfur production units).

The Astrakhan gas condensate field, which was discovered in 1976, is situated very favorably relative to major consumers of gas, which makes this field, too, a promising candidate for rapid development.

Tank natural gas for customers in Astrakhan and the Northern Caucasus will flow through the Astrakhan—Kamysh-Burun pipeline. The condensate will be processed and the valuable petroleum products then shipped to consumers.

Field development plans call for the construction of field facilities for the development wells, gathering gas lines, two combined gas processing plants (UKPG), gas condensate lines from the UKPG to the Astrakhan gas processing works, a main gas pipeline from Astrakhan to the Northern Caucasus, a product line and housing and services facilities.

The engineering involved in the extraction, processing and transportation of the gas and the condensate has taken account of experience with the operation of gas fields with high hydrogen sulfide contents. In addition to a pipeline to carry purified gas, construction will include another to feed in the inhibitor. These lines will be built with heat-treated carbon steel. Joints welded in the field must be heat-treated as well and 100 per cent quality controlled. The gas and condensate will be gathered, transported and field processed within a closed system constructed with materials and equipment resistant to the action of hydrogen sulfide. Corrosion inhibitors will be used to protect lines and equipment against general corrosion. All safety valves will be vented into the closed system to prevent the release of hydrogen sulfide into the atmosphere when the system is purged for repairs.

The Astrakhanneftegazstroy Trust is the general contractor for the construction of these field facilities. Glavyuzhtruboprovodstroy will be responsible for construction of the external mains.

The fact that the area in which the Astrakhan gas condensate field is situated is semiarid, while the western part of it borders on the vast Volga-Akhtubinskaya floodplain, a large area of which is flooded in the spring, poses certain difficulties for the development of the field.

The Karachaganak gas condensate field is located in Uralsk Oblast in Western Kazakhstan. The climate of this region is markedly continental. Temperatures range between 42 °C and -42 °C. Work has now been completed on the first gas preparation facility. October 1984 saw the beginning of pilot operations at the Karachaganak field.

The Shurtanskiy gas complex is situated in the Uzbek SSR's Kashkadarinskaya Oblast. The operation here is the first one in the country to transport gas containing hydrogen sulfide for more than 400 km. The operation of this field over the past few years has demonstrated the reliability of both the facilities here and the main gas line.

The construction organizations of Minneftegazstroy are responsible for the construction of most of the field facilities. They will be putting up the operational facilities, the communications lines, the roads and facilities to accommodate social and cultural services and housing.

Fields where the oil and gas contain hydrogen sulfide place special demands on both the engineers and the builders. In view of the fact that these fields are located far from existing centers of the construction industry, developers have in a number of instances had to build new ones or relocate or set up their own construction and installation organizations.

VNIIST [All-Union Scientific Research Institute for the Construction of Trunk Pipelines] and its branch in Orenburg have been involved in the development of special welding procedures. These organizations have presented a number of engineering solutions for welding problems which vary according to the composition of the gas, the method by which it was processed prior to transport and the type of inhibitor employed.

Fields can be divided into a number of categories according to hydrogen sulfide content. In fields where partial hydrogen sulfide pressures do not exceed 0.01 MPa, the lines can be built with standard pipe. The welds on these pipelines do not require heat treatment.

When hydrogen sulfide reaches 6 per cent, we must go to special 20 YuCh pipe steel, which is resistant to the effects of hydrogen sulfide. This pipe can be welded with electrodes in either cellulose or other more basic types of sheathing and then heat-treated to relieve internal stresses. Pipelines welded by this method in Orenburg have been in successful operation for some 10 years now.

For the development of oil and gas fields with hydrogen sulfide levels as high as 25 per cent and carbon dioxide impurities, pipe will be supplied in accordance with special specifications with substantial limits on the content of sulfur and the carbon equivalent. These pipelines are welded and the joints heat-treated by a process similar to that employed on pipelines with 6 per cent hydrogen sulfide in the gas. More stringent requirements are imposed on the quality of the joints in this case, however. Pipe up to 150 mm in diameter should be argon-arc welded, particularly the base of the seam. This new welding technique has now been introduced at the gas field in Astrakhan Oblast and the high-sulfur oil field at Tengiz.

VNIIST is currently at work on the development of special welding materials; the metallurgists are engaged in efforts to improve our pipe steel and the Ministry of the Gas Industry together with the construction people are at work on a better method of designing pipelines to carry sulfur-containing gas and ways to speed up corrosion tests on pipelines and welds.

The basic technical approach to solution of the problem of accelerating the development of these fields consists in what is referred to as the modular unit method of constructing an industrial facility, a method which substantially reduces the time required to put these facilities up as well as labor costs at the construction site. The modular unit approach helps improve the organization of construction operations and both the efficiency and quality of the construction and installation work. Employment of the modular unit method in the construction of faciliites at the Karachaganak and Zhanazhol fields made it possible to complete construction and put these complexes into operation within fairly short periods of time. In the construction of field facilities at the sites of new production operations we will also be turning attention to efforts to increase the unit capacity of our equipment and intensify production operations. The functions of different operational facilities should be combined and the size of the monitoring and automated equipment reduced.

Rather than the construction of individual operations buildings, we are now seeing the use of modularized containers as small buildings.

General plans will be minimized by reducing the number of units and unit boxes, establishing an optimum design for the modular facility and by cutting the number of fire barriers down to the minimum established in "Design Standards for Modular Oil and Gas Industry Facilities."

Auxiliary and engineering support systems will incorporate no intermediate heat-transfer agents. All production processes will be automated and remotely controlled. A great deal of attention is being given to the centralization of all maintenance and repair services with both shift- and nonshift-based operations employing the unit assembly maintenance method.

Improvement of the engineering economic indicators for modular facilities will help identify and eliminate structural, functional and informational redundancies, which in turn will make substantial reductions in construction and operational costs possible without degrading operational capacities. Going over from a vertical to a horizontal absorption facility, for example, will make it possible to dispense with the traditional central building, substantially increase the degree of completion to which equipment can be brought before it leaves the factory and to use the container units as protective barriers. A horizontal design will also make possible a substantial increase in the unit productivity of these facilities by increasing the number of internal nozzles without altering the length or the diameter of the unit.

Design organizations also have the important task of keeping the engineering and design of the null cycle separate from the construction of the sections of a facility above ground, which makes it possible to organize the construction of gas and oil industry facilities on a flow-line basis as well as to eliminate the so-called "wet" and labor-intensive operations from the construction site.

The industry's scientists, planners and designers have developed and are now series producing modular units for both main and auxiliary production operations, the use of which in designs for new field facilities will make substantial reductions possible in both the duration of and manpower required for construction and installation operations. This would include primarily the combined gas-preparation facilities, modular boiler, purification and waste disposal units and the operational and garage complexes. The experimental reinforced concrete design offices have designed and industry enterprises are fabricating entire buildings to accommodate 40 residents and more, health and services facilities, dining halls and entire housing developments.

The great distances and the unusually difficult conditions under which things have to be transported here require the use of effective protective structures made of galvanized corrugated steel and PSF-VNIIST foam plastic, which make it possible to save up to 15 kg of sheet metal per square meter of panel.

Field facility construction operations should be organized on the basis primarily of the continuous (permanent) flow method, which insures uniform and efficient utilization of materials, equipment and manpower and reduces construction time. The organizational basis for this type of operation has been established with the creation of mobile trusts and mechanized columns specializing in the construction of the null cycles and the above-ground phases of a facility.

The development and implementation of a well-conceived program of social support for the workers and engineering and technical personnel involved in the construction of new oil and gas field facilities is now one of the extremely urgent and at the same time difficult tasks facing the industry. It must develop a program of measures which will improve working conditions and raise the standard of living of industry workers and create the social and economic conditions for more

efficient field construction operations. A great deal remains to be done in the way of increasing pay and economic incentives for industry personnel and to improve the organization of material supplies and communal dining services.

The modular unit method contributes to an objective improvement in working conditions and in living conditions for the workers and their families. The difficult jobs on the construction sites are replaced by work in permanent facilities. It reduces the amount of manual labor which has to be done and, by going to the shift-assignment method, cuts down the amount of time construction workers have to spend at the sites, which makes it possible to create stable work collectives.

The development of new fields and the establishment of specific new requirements on production operations dictates the need for thoroughgoing analysis and evaluation of current construction and installation operations and the development and introduction of new methods which will make it possible to complete an operation in the shortest possible period of time with guaranteed work quality with the least number of workers directly involved at the construction site itself.

The development of new oil and gas condensate fields wil contribute not only to efforts to build up the country's fuel and energy resources and to substantial increases in producing chemical raw materials, but also to improvements in the infrastructure, the transportation system and the construction of modern towns and worker settlements.

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OIL AND GAS

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MODULAR FIELD FACILITIES IN WESTERN SIBERIA DESCRIBED

Moscow STROITELSTVO TRUBOPROVODOV in Russian No 2, Feb 85 pp 5-6

[Article by A. I. Byachkov and Ya. M. Kagan, Giprotyumenneftegaz, Tyumen: "Improving Modular Construction Methods in the Oil Fields of Western Siberia"]

[Text] The fabrication of modular units (MU) in special manufacturing facilities makes it possible to deliver these units to the construction site with all equipment, electromechanical units, monitoring and measuring systems and automatic systems installed and tested. For it to be possible to prefabricate these modular units, they must first be suited for transport and delivery from the manufacturer to the construction site. Transportability will therefore constitute a major factor in determining the dimensions and weight of a given unit.

These units can be transported to the oil field by any available means. Since it is the most universal means of transportation, the conditions encountered in rail transport have so far governed the dimensions of the individual modules.

The following types of modular units are currently employed in the construction of oil field facilities: small units, open and enclosed, completely factory equipped and provided with their own support systems and small sectional units which fit together to make a complete facility. These modules can be up to 12 m long, 3 (3,2) m wide, 4 (3) m high and weigh as much as 30 t. They enable a manufacturer to fully prefabricate as many as 50-55 per cent of the above-ground field facilities. The widespread use of these prefabricated modular units has made it possible over the course of the past 15 years to produce and process more than two-thirds of the oil extracted in the Tyumen region in modular facilities. And in the vast majority of cases we will see modular group pumping stations used to inject water into the formations.

Analysis has shown that the technical level at which the prefabricated units are currently being produced is not altering the proportion of modular construction within the overall category of capital investment in oil field construction, which remains at an average of 7.1 per cent. The increase in modular construction has been proportional to the increase in capital investment overall.

With the objective of increasing factory prefabrication rates to somewhere in the neighborhood of 90-98 per cent, of enlarging the individual modules and,

finally, of achieving substantial economies in manpower and materials, Giprotyumenneftegazstroy is currently designing and planning the construction of facilities for a number of oil fields which will use much larger, super-size, units weighing up to 400 t. The use of these larger modules offered the possibility of performing the entire range of installation and adjustment work on mechanical, production and power systems, the automatic and monitoring and measuring equipment and the life-support systems right in the manufacturing facility itself. The manpower required to put up a field facility consisting of these superunits and the time required to bring new capacities on line have been reduced sharply.

The use of supermodules in the construction of oil field facilities has generated both qualitative and quantitative changes in the general plans for a facility as well as in the planning, design and structural and engineering decisions involved. As compared with the smaller modules, the new design solutions reduce the size of the construction site (for the group GPS and high-pressure HPS pumping stations 1.5-2-fold, up to 3.5-fold in the case of the oil preparation facilities OPF), the road area to be surfaced (2-3-fold for GPS and HPS, 5-fold for OPF) and the size of the engineering communication systems some 1.5-3-fold without degrading the operational capacities of the facilities involved.

The engineering-economic advantages to be derived from the design and engineering solutions for a facility using the superlarge modules can be realized given the right kind of transportation and the availability of means by which to deliver these modules and can be computed in accordance with the engineering economic formulas.

The construction of field facilities using superlarge modules posed the problem of establishing maximum permissible size and weight taking account at the same time of what it was going to take to deliver them to the field. The process of transporting and delivering these modules consists in getting them onto the water or loading them on a barge (special means of transportation), maneuvering them along the waterways, offloading them from the boat onto dry land and then transporting them the rest of the way to the construction site by land. Western Siberia's ramified system of waterways makes it posssible to transport superlarge modules from Tyumen directly to the oil fields. The most important waterways used here would include the Tura, Tobol, Irtysh and Ob rivers and the Ob and Taz gulfs.

Analysis of the requirements for transporting and delivering the superlarge modules has shown that the maximum dimensions for movement along the Tura, Tobol, Irtysh and Ob rivers in the vicinity of Tyumen are the following: length - 150 m, width - 32 m, height - 19 m and weight - 8000 t. Maximum permissible dimensions for transport along the smaller rivers and rivers for which no dimensional standards have been set for riverine shipping are as follows: length - 36 m, width - 17 m, height - 19 m and weight - 500 t. The figures in these categories for overland shipment are: weight - 800-1000 t, length - 50 m, width - 18 m and height - 20 m.

The high economic engineering indicators of the structural design solutions incorporated in facilities constructed with supermodules predetermined the possibility of achieving the same figures for the general plan by building

facilities with smaller modules. Modular units of a size to permit them to be transported by rail can be interlocked with one another on all sides to form a structure similar to one built of supermodules. Modular units of this design come factory-equipped with maximum size and weight governed by limitations imposed by the means of transportation. They can be used to build a variety of facilities with varying primary parameters.

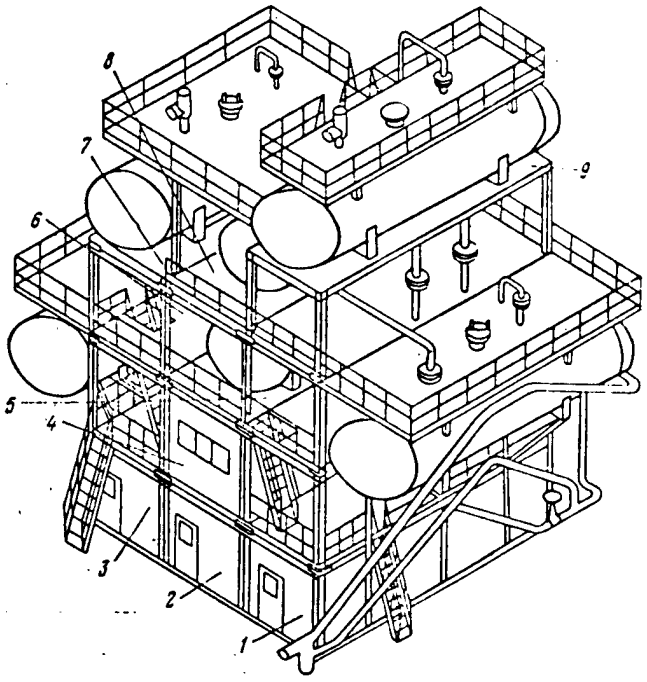
Construction of a facility using modular units requires more time at the construction and installation site, but it cuts down the size of the building site and the supply lines required as compared with modular structures built of individual small open or enclosed units. The first facilities like this put up in the fields included brigade units with preliminary removal of water and measurement of oil, gas and water and group pumping stations developed during the engineering proposal stage by Giprotyumenneftegaz using technology developed by VNIISPTneft.

The use of modular facilities built of a number of modular units in the construction of field facilities offers an alternative to the construction of units using the supermodules if the larger modules cannot be effectively employed in a particular area or if they cannot be transported.

The brigade facility with preliminary removal of water and measurement of oil, gas and water (see figure) consists of 12 individual open and enclosed modules of the following dimensions: length - 12 m, width - 3m and height - 3m. The frame of each module has vertical and horizontal load-bearing girders. The frame corresponds to the modular requirements of the dimensions of the sides, which insures standardization in construction. With the use of modular units 3 m wide and 3 m high it is possible to interlock the modules both vertically and horizontally because their axes of separation coincide. The vertical side supports of one module are joined at each level with the vertical side supports of the adjacent module by welding through inserts. In the horizontal plane the modules are joined together by the main load-bearing members, thus forming a single large unit. The design of the structure will ultimately be determined by the functional characteristics of the facility. Maximum reductions in the use of metal and other materials are achieved through efficient design, reductions in the pipe and other supply lines required and reductions in the size of the structural components of the foundations.

This approach may be employed in a number of different regions of the USSR given the presence of essential support facilities, such, for example, as machine-building enterprises and construction industry outlets (module fabrication plants).

In efforts to improve our methods of employing the modular approach to the construction of oil field facilities, we must solve the basic problem of establishing the limits to the efficiency with which one group of designs or another can be used. The methodological basis for the selection of a particular modular design consists in an integrated approach to analysis of the comparative efficiency of different versions of a design taking account of the following factors: ϑ_1 - - reduction in adjusted expenditures for fabrication, transport, construction, assembly and operation of the modular facility; ϑ_2 - decrease in "frozen" capital investments due to reductions in the amount of time required to build a



Modular brigade facility with preliminary removal of water and measurement of oil, gas and water: 1 - pumping unit; 2 - oil metering; 3 - preparation and addition of reagent and inhibitor; 4 - gas metering; 5 - control of water removal; 6 - equipment; 7 - settling tank; 8 - gas separator; 9 - water degasifier

facility; $Э_3$ - reduction in the length of time required to bring the facility on line in comparable versions and $Э_4$ - additional production due to reductions in time required to bring facility on line in terms of oil production:

$$Э_1 = (E_н K_1 + C_1) - (E_н K_2 + C_2),$$
$$Э_2 = K_2 \left(1 - E_{нп}\right)^{t_1} - \left(1 - E_{нп}\right)^{t_2},$$
$$Э_3 = E_н K_2 (t_1 - t_2),$$
$$Э_4 = (C_{опт} - C)\,\Delta Q.$$

Here E_n = 0.15 - standard coefficient of efficiency of capital investments; K_1 and K_2 - - capital investments in comparable versions of the facility; C_1 and C_2 - operational costs for comparable versions of facility; t_1 and t_2 - time required to build facility using different modular designs; E_{np} = 0.1 - norm employed to adjust expenditures varying in time; C_{opt} - wholesale price of product (oil and gas); C - - cost of commodity production; ΔQ - production due to reduction in time required to bring unit on line.

Comparative analysis of the versions of a facility design conducted in the process of selecting which structure will be built involves a look at the reduction in overall labor input over the entire "life cycle" of the facility and the manpower required to operate the facility: for fabrication T_{izg}, construction and installation work T_{smr}, transport T_{tr} and operation T_e; this is computed in accordance with the following inequality:

$$T_{изг1} + T_{смр1} + T_{тр1} + T_{э1} \leq T_{изг2} + T_{смр2} + T_{тр2} + T_{э2}.$$

Calculations show that units constructed of smaller modules are best for facilities engaged in comparatively small-scale production and employing the simplest in production operations. The use of modular units, or the supermodules, in the construction of any facility should be decided upon taking account of the factors of reduction in manpower inputs, construction costs over the entire construction cycle and overall operating costs.

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OIL AND GAS

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PROGRESS IN INDUSTRIALIZATION OF OIL INDUSTRY CONSTRUCTION REPORTED

Moscow STROITELSTVO TRUBOPROVODOV in Russian No 2, Feb 85 pp 6-8

[Article by N. V. Bobritskiy, MINKh and GP, and V. D. Shapiro, VNIIST: "Directions in the Industrialization of Oil Field Construction"]

[Text] Today's oil fields are highly mechanized and automated complexes of both underground and above-ground facilities for extracting oil from the ground and then collecting and preparing it for transport by pipeline. An oil production enterprise comprises injection and development wells, systems for metering and gathering oil coming from the well and oil and water treatment systems. Specialized organizations from Minnefteprom [Ministry of the Oil Industry] are responsible for drilling the underground structures for an oil production enterprise, which would include the development and injection wells. Oil field facilities above ground are put up by Minneftegazstroy [Ministry of Construction of Oil and Gas Industry Enterprises].

All new oil-production enterprises have gone to a centralized oil gathering and treatment system. Under this system, automated group measuring facilities (AGMF) and primary oil-separation units are built in the immediate vicinity of the development wells. The most important oil-treatment systems, however, have been concentrated at a central gathering unit (CGU). As a rule, there will be one CGU in each oil-producing area. In some instances, if the engineering economic considerations call for it, two or more CGU will be built to feed several main pipelines originating from the same field. CGU will ordinarily be situated at a central field, a field, that is, which is producing at least 40 per cent of the oil producing in the area during its period of maximum development. If an oil-producing area has no field which can be designated the central, or primary, field for the area, the CGU will be built in the field closest to the beginning of the main pipeline. If the pressure behind the flow of oil mixed with water and dissolved gas coming from the AGMF is not enough to move it through the pipeline to the CGU, we have to build in a high-pressure pumping station (HPS). Located at the CGU are combined oil-treatment facilities (COTF) and water-treatment units (WTU). The COTF remove the water, salt and gas from the oil and bring it up to standard quality. The WTU treat formation water separated from the oil and prepare it to be pumped through injection wells back into the producing formations.

The most important way to increase the efficiency and improve the quality of oilfield construction operations is to place these operations on an industrial

footing. The need for industrial oil-field construction operations is dictated by the small size and capacity and the dispersal of oil-field facilities over a comparatively large area. Particularly at the beginning, oil-field construction

Table 1

Engineering economic indicators for CGU of varying capacities

Indicators	1 m t/yr		3		6		9	
	conv	modular	conv	mod	conv	mod	conv	mod
Capital investment, thous. rubles	5022	3995	7501	5864	10,991	8357	15,026	10,903
For construction, installation, thous. rubles	3188	2444	4668	3082	7207	4328	8256	5483
Labor inputs on site, man-days	74,893	18,447	105,900	48,381	169354	74522	200206	126226
Construction time, months	13	9	18	12	22	14	27	18
Line network, km	14	12.6	28.0	21.6	40.2	26.8	55.3	38.4
Overall area, ha	14	6.0	14.5	7.1	18.0	9.0	24.0	12.0
Economic gain, thous. rub.	—	310	—	428	—	820	—	1497

operations are undertaken far from any centers of population and without the benefit of good roads or supply points which could serve as sources of construction equipment and materials. Field facilities are under construction over the entire period a field is in operation. A substantial proportion of this construction involves the building of underground, surface and above-ground oil pipelines, gas lines and water lines ranging in diameter from 58 to 1220 mm.

The industrialization of any kind of construction operation, and this would include the construction of oil field facilities, is going to involve first and foremost the standardization of the facilities to be built, particularly the oil gathering and treatment systems. Solution of this problem makes it possible to establish optimum nomenclature and parameters for modular equipment and to develop standard designs for different types of oil field facilities. Studies undertaken by Minnefteprom's Giprovostokneft have shown that capacities of 1, 3, 6 and 9 million tons of treated oil per year are best for the central gathering unit of an oil-production enterprise.

The planning and design instutites of Minnefteprom and Minneftegazstroy have developed and are now building almost all the types of facilities referred to above on the basis of the modular principle.

The effectiveness with which the modular method is being employed in the construction of oil field facilities can be seen from the data presented in Table 1, which shows engineering economic indicators for the construction of CGU as compared with the conventional, nonmodular design for the same type of facility.

Of great importance for the construction of oil field facilities, particularly in northern Tyumen Oblast, is the use of larger modules weighing up to 350 t (and ultimately supermodules weighing as much as 1300 t will be used) and with dimensions which considerably exceed those which can be accommodated by conventional means of transportation. An oil field facility built with these supermodules is a virtually complete structure which requires only minimal expenditures of time and resources to assemble in the field.

The Sibkomplektmontazh Association is fabricating and assembling supermodule facilities for the oil industry which include the high-pressure, booster pumping stations, group pumping stations, oil treatment units, compressor stations for moving petroleum (associated) gas, gas-lift compressor units and water collection facilities. Table 2 shows the sizes and weights of supermodules used in oil field construction. These modules are ordinarily shipped to the construction site by waterway. The future, however, will see extensive utilization of air-cushion transport. The use of supermodules in oil field construction which are fabricated entirely at the factory and then moved to the construction site by special means of transportation makes it possible to do as much as 95 per cent of the construction, assembly, start-up and adjustment at the factory itself, cut the manpower required by 30-35 per cent, reduce overall material costs by 10-15 per cent because of the compactness of the design, increase the productivity of the labor involved in fabricating and assembling the modules 2-3-fold and improve the quality of construction and installation operations overall. The use of supermodules also permits introduction of the shift-assignment method for these operations.

Future advances in the industrialization of oil-field construction operations will come with the intensification, automation and remote control of primary and secondary production processes, increases in unit capacity combined with advances in miniaturization and technological effectiveness, multifunctional utilization of structural components, reagents and pipeline transport mediums and elimination of structional and functional redundancies in the production systems.

Another way to accelerate the industrialization of CGU construction is for Minkhimmash [Ministry of Chemical Petroleum Machine Building] enterprises to go over to series production of separation equipment, electric dehydrators, tanks and the units which pump the oil and fresh and formation water to the oil treatment facility. The equipment nomenclature involved here is determined by Giprovostokneft and the Proyektneftegazspetsmontazh special planning and design office.

Current designs permit us to move ahead with the standardization of general plans facility designs and make it possible for our machine-building enterprises to deliver modular equipment for all standardized production systems. The use of "Design Standards for Modular Oil and Gas Industry Facilities" offers a real possibility for increasing the compactness of general plans as well as of the individual modular structures. By making production facilities and units more

self-contained and making more use of air cooling and heat-utilization systems we can cut down on the amount of work which has to be done at the construction site. More studies need to be done which focus on the objective of making the units containing electrical panels and automatic control and communications more compact by using modules prefabricated to the greatest possible extent by the manufacturer. This will make it possible to separate work on the design and engineering associated with the null cycle from the construction of the above-ground part of a facility.

Table 2

Size and weight of supermodules used in oil field construction

Facility	Number of modules	Maximum dimensions of module (length x width x height), m	Weight of largest module, t
High-pressure pumping station with throughput of 1 or 3.5 mil tons/yr	2	21.2x12.6x18	320
Oil treatment unit	3	25x11.5x20	250
Compressor station for transportation of petroleum gas (gas treatment unit + gas compression unit)	2	23.6x13.5x11.5	350
Floating boiler unit	2	20.05x10.4x11.4	238

Improvement and maximum centralization of maintenance and repair services, particularly in regions which have already been developed, with the use of the unit-repair and shift-assignment methods will make it possible to reduce the amount of construction and installation work required to put up production maintenace and housing and services facilities in the oil fields.

Development and coordination with the machine-building ministries of an interdepartmental program for the construction of modular equipment will help make it possible to implement these steps to greater construction and operational efficiency. We have to develop CGU designs which offer more compactness in the general plans and the individual modular units and take steps, which here would involve both the organizational and engineering aspects of the problem, to make it possible to build more of a facility in accordance with the modular principle.

The most important areas in which we can accelerate the industrialization of oil-field construction operations would include the following.

In the area of the construction of modular facilities: standardization and higher level of industrialization and production engineering efficiency in the fabrication of modular components; nontraditional foundations and supply line networks, which will make it possible to minimize the amount of manual labor required and eliminate the "wet" processes; effective materials for use in the construction of enclosing and load-bearing components.

In the area of the organization of construction operations, manpower management and administration: preparation for construction operations (to include the engineering and organizational planning) on the basis of a single industrial system and automated planning of the organization of construction operations; the unitization of structures and resource flows with the use of "set assembly" structures; integrated (step-by-step) specialization of construction and installation organizations; going over in the future to the "turnkey" method of construction; organization of construction operations on a continuous flow basis (the continuous-flow method in combination with the continuous flow-integrated method); a shift-assignment system of manpower organization; automated construction operations management system.

In the area of construction operations technology: unitized (modular, mobile) operations facilities and equipment with the introduction of mobile, modular field facilities; formation of sections (administration) supported by small-scale mechanization with a system of modular equipment-distribution centers and mobile laboratories for quality-controlling construction and installation operations; employment of standardized construction methods based on the use of an industry library of standard operational plans and procedures and full mechanization of operational processes; multipurpose machines and equipment combined with methods of loading, unloading and assembling modular facilities and equipment without the use of cranes, to include the use of air-cushion transport.

A systems-oriented solution of these problems on the basis of the systems programming method implemented in accordance with the interdepartmental scientific-technical and production-economic target program for the development of modular oil and gas industry facilities will be of great economic benefit, first and foremost by making it possible to reduce construction completion times.

8963
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OIL AND GAS

PRODUCTION OPERATIONS IN SAMOTLOR OILFIELDS DESCRIBED

Baku VYSHKA in Russian 1 Jun 85 p 2

[Article by S. Bagdiyan, senior engineer, well-repair department, Azneft' Production Association: "Next Shift in by Aircraft"]

[Excerpts] The oilmen in the fields of the Caspian and Samotlor have but one objective—to provide the country with more of this valuable raw hydrocarbon. Contributing its mite to the accomplishment of this task is the Azneft' Association's well-repair department, which has been attached to the oil and gas production administration of Samotlorneft'.

April saw the Baku repairmen meet their well-repair target by 104 per cent and turned 19 wells back over to the field operations crews. The high quality of the work done on the repairs and the change over to the gas-lift method have yielded good results.

After coming back on line, each one of the wells which had been down for repairs began to produce at levels averaging 35-110 tons a day higher than before the repairs. Foreman Agaragim Agaragimov'sbrigade of the oil and gas production administration of Siazanneft' achieved a record increase at well 2567. The increase in production here after repairs and the resumption of operations reached 340 tons.

Still in first place in socialist competition among Baku repairmen at Samotlor is Gurbanali Zeynalov's brigade from Leninneft's oil and gas production administration, which completed repairs on three wells during April. Brigades under foremen Rasim Kuliyev, Rasul Dzhabrailov and Agaragim Agaragimov each completed work on two wells. They all met their April target by some 150-200 per cent.

Zeynalov's brigade is fulfilling its promises with concrete deeds. After undertaking the obligation to complete repairs on one well during the first 10 days of May in honor of the 40th anniversary of the victory, it completed these repairs on precisely the date announced. Of the ten Baku brigades, six more have achieved the same goal.

The management of the Azneft' and Nizhnevartovskneftegaz associations have done a lot to improve the organization of the living arrangements and leisure time activities for the repair crews. Special Aeroflot flights from Baku to

Nizhnevartovsk replace them with new crews every 15 days. June will see two workers 'dining facilities open in two groups around Samotlor. Everything is being done to create all the conditions for good, productive labor on the part of these crew shifts.

... A rapid take-off run from the runway at Nizhnevartovsk airport and then precisely four hours later the crew of the TU-154 of the Azerbaijan civil aviation administration captained by A. Dzhe brailov, an experienced pilot, delivers another shift of repairmen. Two weeks later then back again for another shift in Siberia.

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OIL AND GAS

OBJECTIVES IN DEVELOPING THE YAMBURG COMPLEX

Equipment, Construction Problems Examined

Moscow STROITELSTVO TRUBOPROVODOV in Russian No 1, Jan 85 pp 6-8

[Interview with Aleksandr Moiseyevich Krayzelman, Chief of the Main Administration of Production Efficiency Control and member of the ministry's board, by L. P. Klyuchnikova: "Yamburg--Prospects and Problems"]

[Text] Yamburg. It is still a small settlement in the Nadym region of Tyumen Oblast, which still has not been entered in the country's geographical atlas. In the near future, a large rotating-crew settlement with a full set of conveniences for habitation by construction and gas-recovery workers will rise up here. The Yamburg gas-and-condensate field should become the main raw-materials base for supporting further growth in gas recovery in West Siberia during the 12th Five-Year Plan period.

A colossal amount of work is to be done in order to carry out this task, which the party and the government set for Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises] and for collectives of other ministries and agencies.

The journal's editorial board asked chief of the Main Administration for Production Efficiency Control and member of the ministry's board, Aleksandr Moiseyevich Krayzelman, to answer some questions that touch on the problems and prospects for building up the Yamburg gas and condensate field.

[Question] What is the Yamburg field's significance for realization of the USSR Energy Program?

[Answer] Thanks to the opening up of such gas and gas-and-condensate fields in Siberia as Medvezhye, Urengoy, Yamburg and others, a reliable raw-materials base has been created for accelerated development of the gas industry during the 12th Five-Year Plan and the next plan period. During the 12th Five-Year Plan the main growth in gas recovery should come from the Yamburg field. It will also provide for a substantial increase in gas-condensate production. That is why the party and the government have decided to consider

development of the Yamburg field as a most important task of the national economy. Since the more rapidly its contribution to the USSR Energy Program is effected the more rapidly an economic benefit is obtained, the Yamburg field is to be developed and brought up to design capacity in an exceptionally short time.

[Question] What are the volume and pace of the forthcoming operations?

[Answer] The budget-estimated cost of the buildup is 4.5 billion rubles. In 5 years 10 integrated complexes for treating gas and condensate and 5 installations for extracting ethane from gas condensate and for obtaining diesel fuel from the tank farms are to be erected at the field, more than 2,300 km of interfield gas collectors, condensate pipelines, methanol pipelines, water mains and intrafield pipelines are to be laid, and 780 wells are to be hooked up. Realization of the assigned task will require creative efforts and selfless labor from the construction-worker collectives and a great increase in the work pace in comparison with what was achieved previously during the buildup of West Siberia's gas fields. For comparison, the following can be noted. Ten integrated gas-treatment installations were built at the Urengoy field in 8 years, but at the Yamburg field the same amount of work must be done in 5 years. Urengoy reached today's gas-recovery level in the seventh year of operation; Yamburg should come up to it in 4 years. At Urengoy, condensate was recovered in the fifth year after the start of gas recovery, while at Yamburg this is to be done in the second year.

[Question] A rapid work pace, combined with increased reliability, is characteristic of oil and gas industry construction projects. What is there at Yamburg that will complicate its development?

[Answer] The work will be done under the severe natural and climatic conditions of subarctic latitudes. The average winter lasts more than 8 months. The coldest time of the year is December to March, when the temperature reaches -60 degrees C. The summer is short--June to August, during which 30 percent of the days are stormy and the monthly average temperature for the warmest month is 13 degrees C. Permafrost in the area of construction is 200-300 meters thick. The soil thaws 40-50 cm in the summer. Soil temperatures are -2 degrees C to -4 degrees C at a depth of 2 meters, and -5 to -6 degrees at a depth of 6 meters. The area where the construction is to be performed is marked by a dense array of marshes and lakes. It is clear that the permafrost, swampiness and degree of inundation of the territory and its remoteness from populated places and industrial bases--all these will greatly complicate construction.

[Question] The specifics of the construction region and the period for developing it predetermine, naturally, operating methods at Yamburg. What are the main organizational, technological and constructional decisions that have been made?

[Answer] Because of the exceptionally severe natural and climatic conditions Yamburg is to be built up by the rotating-crew method. The principle of building on permafrost, that is, preserving it in its natural state, was adopted for building the facilities. This is accomplished by filling in all the facility sites and all the roads with sandy soil, by insulating pipelines

thermally, by laying the intrafield lines above ground (on supports), by building ventilated basements under buildings and structures, and by using pipe-type footings structure and metal foundation mats. As for erection of the integrated gas-treatment installations, we have had to dispense with the traditional solutions, under which equipment and modules are sent separately to the construction site and then erected on the spot, because of the severe natural and climatic conditions and the lack of a reliable transportation net. New and progressive design layouts and organizational and technical solutions will be used. The detailed design for building up the Yamburg field which was developed jointly with YuzhNIIgiprogaz [Southern Branch of the State Scientific-Research Institute for the Design of Gas-Industry Enterprises] and SibNIPIgazstroy [Scientific-Research and Design Institute for the Construction of Gas-Industry Enterprises in Siberia], calls for the use at each integrated gas-treatment installation of pontoon modules which are completely manufactured and assembled at the factory and transported to the erection site. The buildings for the operating premises and auxiliary facilities will be made up from them at the construction site, the premises will be interlocked, and the process pipelines, air conduits and utility and service lines will be mated.

[Question] Where distances from production bases are great and access is difficult, the effectiveness of using large pontoon modules increases. What is the weight of the pontoon modules designed for building up the Yamburg field, and what method is specified for transporting them?

[Answer] The maximum weight of the pontoon modules for Yamburg is in the 260-300 ton range. It is planned to transport them over water and then over dry land, by using special arrangements based upon the ground-effects principle. In 1985 a universal set of towed, easily erected equipment should be created for transporting modules that weigh up to 300 tons on ground-effects vehicles. Later, equipment for modules weighing 1,000 tons or more that are fully readied at the factory are to be developed. In 1985 Sibkomplektmontazh [Siberian Association for Erecting Outfitted Modules] is to manufacture and deliver to the erection site 24 modules for the first integrated gas-treatment installation (UKPG)--No 2, including modules for operating premises for treating gas, for regenerating DEG [diethylene glycol] and methanol, for the water-supply plant, and so on.

[Question] Yamburg should be conquered with the use not only of industrialized constructional structure and materials but also with more modern equipment. What new machines and mechanisms will find application during the field's buildup?

[Answer] Already in 1985 test models of a completely configured rotary excavator, an installation for thermal sinking of piles, a piledriver for installing LEP [power transmission line] supports based on the BS361A swamptraveler, a module transporter on a chassis with an active drive from a K701 tractor, and so on, are to be fabricated and tested. Semifixed installations for electrical resistance welding of pipe 114-325 mm in diameter will be used widely. A special module complex is to solder methanol pipelines 57 mm in diameter. A mobile installation for making polystyrene-foam slab for the thermal insulation of 1,420-mm gas pipelines will be built.

[Question] What work should be done at Yamburg during the concluding year of the 11th Five-Year Plan?

[Answer] Eighty million rubles are to be assimilated at the Yamburg field in 1985, versus the 15 million rubles set under the 1984 plan. It is planned to put into operation a modularized gas-turbine electric-power station, using unified modules, and the first phase of a water intake with water mains for the housing settlements and for providing water for drilling, construction and installing operations. Housing 8,500 m^2 in area must be built at the Yamburg settlement, as well as at 3 settlements for construction workers--for 400 residents each--in the vicinity of integrated gas-treatment installations Nos 1 and 2 and the Yamburgskaya Compressor Station.

In order to be able to deliver gas from the Urengoy Field to the Yamburg-Yelets-1 gas pipelines in the first quarter of 1985, Glavsibtruboprovodstroy [Main Administration for Pipeline Construction in Siberia] and Glavtruboprovodstroy [Main Administration for Pipeline Construction] must lay an interfield collector from Integrated Gas-Treatment Installation No 11 to Yamburg's terminal compressor station.

Nadymgazpromstroy [Nadym Trust for the Construction of Gas Industry Enterprises] is doing preparatory work on the UKPG-2 construction site, which should be built in 1986 and turned over for operation in the first quarter of 1987. During the erection of UKPG-2, more than 7,000 piles are to be sunk, 60 km of gas pipeline and intrafield pipelines must be laid, and 60 km of access roads to the well clusters and to the rotating-crew complex must be built.

[Question] What changes have been introduced into Minneftegazstroy's structure in connection with the unfolding of operations at Yamburg?

[Answer] A main administration for the buildup of oil and gas fields in the North of Tyumen Oblast--Glavyamburgneftegazstroy--was created in the ministry a long time ago.

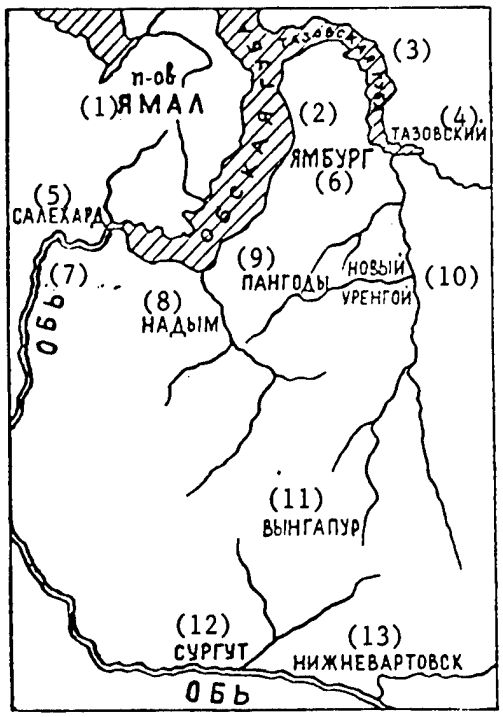
[Question] In order to carry out the tasks set for the industry's subunits that are engaged in building up the Yamburg field, a number of technical problems undoubtedly will have to be solved. Can you point some of them out?

[Answer] For example, Mingazprom and its institutes must examine the potential for excluding "wet" processes during the laying of footings. The problem of providing for a water route for follow-up exploration of water-bearing formations in the lower horizons must be solved. Effective methods are to be developed for sinking piles in permafrost by using a vibrating leader and flame drilling. Trestlework structure for supporting pipelines and utility and service lines must be unified to the maximum. In order to reduce the length of pipelines and roads within the fields, it is desirable to site eight wells in each cluster instead of the four called for. A decision must be made on which is more effective for use in laying roads--nonwoven material or slab insulators--in order to prevent warming of the natural soil of the subgrade. There are still many other technical problems for comprehension and engineering creativity.

[Question] How will the problem of providing the construction sites with soil be solved during the initial period of developing the field, considering that quarries at the field have not been developed adequately yet?

[Answer] More than 40 million m^3 of rock materials must be delivered to the Yamburg field facilities as fill for the sites, in order to preserve the

1. Yamal Peninsula.
2. Ob Gulf.
3. Tazovskiy Gulf.
4. Tazovskiy.
5. Salekhard
6. Yamburg.
7. Ob.
8. Nadym.
9. Pangody.
10. Novyy Urengoy.
11. Vyngapur.
12. Surgut.
13, Nizhnevartovsk.



tundra cover to the maximum. For example, more than 2.5 million m^3 must be imported for erecting UKPG-2 alone. In 1985 the Ministry of Transport Construction is to test hydraulic fill so that positive results may bring its volume later to 10-12 million m^3 per year. In this connection, RSFSR Ministry of the River Fleet and Ministry of Railways will initially ship sand and gravel by rail and water.

[Question] The program for developing Yamburg is long in range. Success in meeting it depends greatly on the degree to which the "secrets" of permafrost are studied. What has been undertaken in this area?

It is planned to do scientific research at the Yamburg field in a study of the permafrost zone, so that recommendations may be worked out for developing the region's production facilities and social and domestic-services infrastructure.

[Question] What basic policies have been adopted for developing bases for construction-industry work and for repairing and servicing equipment.

[Answer] Since rotating crews will do the construction, it is planned to supply the facilities being erected with materials and structure by expanding existing enterprises, not by establishing new bases. Capacity for producing prefabricated reinforced concrete and gravel at the Kharp enterprise under Glavurengoygazstroy [Main Administration for the Construction of Gas-Industry Facilities at Urengoy] will be greatly increased. Sibkomplektmontazh will increase production capacity for outfitted-module construction. Bases required for technical servicing of machinery and mechanisms and the organizations that will repair them--only by the assembly and component method--are being specified.

[Question] Building up fields in severe natural and climatic conditions brings up, along with technical problems, no less urgent problems of personnel. How will workers be trained for Yamburg? What sources will augment the army of construction workers?

[Answer] Glavyamburggazstroy and the ministry's Administration for Worker Cadres and Domestic Affairs are charged with organizing training and raising worker qualification, steps needed for building up the Yamburg field.

It is proposed to augment the builders' ranks at Yamburg basically through various Komsomol and undergraduate-student shock construction detachments.

The buildup of the Yamburg gas and condensate field has been announced as an All-Union Komsomol shock construction project. Here, as at other facilities of the Tyumen North, youth will find a worthy application of their enthusiasm, energy and creative pursuit, and it will harden their character.

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Engineering-Geology Problems

Moscow STROITELSTVO TRUBOPROVODOV in Russian No 1, Jan 85 pp 8-9

[Article by Yu. F. Zakharov, TyumenNIIgiprogaz [Tyumen State Institute for Scientific Research for the Design of Gas Pipelines and Gas-Industry Enterprises]: "Engineering-Geology Problems in Building Up the Yamburg Field"]

[Text] The complicated interaction of the technical and geological spheres out of which geotechnical systems are formed is more characteristic for the Yamburg field than for Urengoy. Here there is a higher vulnerability of Nature's environment. Therefore, earthmoving operations, insuring the prescribed shape of the ditches, sinking piles, ripping permafrost and insuring the stability of branching-configuration pipeline components present greater difficulties.

The Yamburg-field ground, which has been frozen for many years, is represented primarily by soils which are mainly sandy loam and dust and low in temperature (the temperature below the layer that changes temperature annually reaches -7.2 degrees C), and, when they thaw, they lose their load-carrying and binding properties and exhibit thixotropic thinning. The ground, especially in the northern portion of the field, contains vast sections that are highly icy (a content of up to 80 percent) and veins and seams of buried ice. The engineering-geology conditions still have not been adequately studied. The space-and-time patterns of the geomechanical, thermal, hydrodynamic and geochemical interrelationships of targets for the recovery and transport of gas taken from freezing, thawing and frozen soils are not well known. Practically no reserves of construction sand (for use as fill) and underground and surface water* suitable for supplying water for industrial, household and drinking purposes have been found.

Experience in the operation of similar facilities in similar engineering-geology conditions indicates that some accepted design solutions for engineering preparation of routes, construction sites and the below-grade cycle for facilities for the recovery and transport of Yamburg field gas cannot insure fully their reliability over the course of the whole period planned for operation of the field and the trunk pipelines.

The effective constructional, industrial and economic conquest of fields such as Yamburg can be raised in several ways. The area of the fields and the routes for shipping out the gas should be mapped in detail in good time by geocryological and hydrogeological surveys, accompanied by the drilling of a grid of appraisal wells. Development of the field should start with the

*The region's water surface comprises 35 percent of its total area.

industrial-test stage, during which it is desirable to perform full-scale experiments for studying the thermal, geomechanical and other types of interaction of the facilities for recovering and transporting gas with the geological medium. The detailed and authentic information required about the structure and condition of rock that has been frozen for many years and future changes of them cannot be obtained by other methods. Quantitative forecasting by analogy with other gas-field and gas-transporting geotechnical systems of West Siberia are not uniform, since the criteria of similitude established in such cases cannot satisfy the requirement of the methods of analogy. Surveys for the design of specific gas-field and gas-transport facilities on Yamburg-field land are not regulated by the governing chapter of SNiP [Construction Norms and Regulations] II-9-78 and by the methodics-standardizing documents that have been developed, since their scope does not extend either to such regions or to gas-field and gas-transport construction (SN [Construction Norms] 225-79).

Clients must intensify monitoring over gas-transport and gas-field construction, place high requirements on its quality and on the technology and results of testing of completed facilities, prevent even the slightest nonconforming deviation from the design solutions, especially in construction of the below-grade cycle and in the engineering preparation of the land, and organize a ramified system of surveillance over the status of the soil foundations of the facilities for recovering and transporting gas and over the whole geological medium in the zone of influence of these facilities.

In order to realize the enumerated requirements and with a view to supporting the operational reliability of the gas recovery and transport facilities at the Yamburg field and on external-transport routes, a Geological-Engineering Monitoring Service is being created in fulfillment of a joint decision of the Mingazprom [Ministry of Gas Industry] Scientific and Technical Council and Tyumengazprom [Tyumen Gas-Industry Production Association] of Minneftegazstroy [Ministry of Construction of Petroleum and Gas-Industry Enterprises].

This service's mission includes an analysis of the changes in the geotechnical systems that are occurring in the geosphere and their negative effects on the man-made elements of the environment, and also an engineering substantiation of the preventive and restorative measures that are taken. The purpose of engineering-geology monitoring is to insure the design reliability of the gas-industry facilities and the protection and preservation of the geological medium from disturbances and pollution. The engineering-geology monitoring system includes the aggregate of its monitoring instrument resources and their functioning in space and in time, the substantiation and designation of organizational and technical measures aimed at getting the reliability required of the physical geotechnical-systems elements that invade or affect the environment, and the protection of the geological medium and the environment from disturbances and pollution. The monitoring system calls for the participation of the people who implement it in the selection and execution of measures and in evaluating the results.

The monitoring service will consist of two parts: the production part (from Yamburggazdobycha [Yamburg Production Association for Gas Recovery]) and the scientific part (from TyumenNIIgiprogaz [Tyumen Scientific-Research and Design-Development Institute for the Gas Industry]). The first stage in implementing

the indicated decision was the creation of TyumenNIIgiprogaz's Yamburg Frozen-Ground Station. The monitoring service will be granted the rights to monitor the execution of construction work, to obtain any executive constructional documentation, and to stop construction not only when design deviations committed by the builders appear but also when considerable differences are observed between the actual engineering-geology conditions (established during earthmoving work) and that described in the survey papers. The builders should be ready for the engineering-geology monitoring service to make active use of all the rights granted it. No pleading of supershort deadlines and lags in the fulfillment of construction plans will be considered. The designs for organizing construction developed by Orgtekhstroy [State Trust for the Industrialization of Construction] should correspond strictly to the requirements of the design of the methodics-standards documentation.

Despite the specific requirements of the SNiP II-18-76 chapter about systematically observing the condition of the soils for the foundations and footings of buildings and structures--soils based on material that has been frozen for many years, the designs for building up the Yamburg field practically do not call for the installation of monitoring and measuring equipment (deformeters, deflectometers, manometers, thermometers, heat-flow meters, markings, bench marks, piezometers and other devices). The first task of the engineering-geology monitoring service will be to eliminate these gaps in design and to realize, jointly with the builders, appropriate supplementations of the design, particularly to the installation of the required control and measuring devices on gas-recovery and transporting facilities and in their soil foundations. We hope that the builders will treat such additional work with understanding.

Tyumengazprom subunits are taking steps aimed at improving design decisions for building up the Yamburg field. TyumenNIIgiprogaz has proposed piles with progressive structure instead of the traditional piles made of discarded metal drill pipe; and the adjustable joining of pile caps with the supports of important outfitted-module installations, which will permit uneven subsidence of the structure's footings to be eliminated quickly. With the help of State Hydrological Institute staff workers, several lakes that do not freeze over in the winter have been found. This will help to solve the problem of water supply for some constructional and industrial facilities in the winter. Careful preplan studies were carried out on using the most effective local materials--ice and icy soil--for construction purposes. A program of engineering-geological, hydrogeological and geocryological research aimed at providing for reliability for Yamburg field gas recovery and transport facilities and for preservation of the environment has been worked out and implementation of it has started.

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Transportation Challenges, Solutions

Moscow STROITELSTVO TRUBOPROVODOV in Russian No 1, Jan 85 pp 9-10

[Article by A. Ya. Sorochenko (Glavurengoygazstroy, Novyy Urengoy): "The Delivery of Freight to the Field"]

[Text] The delivery of equipment and materials has been assigned an important role in the buildup of Yamburg. Glavurengoygazstroy [Main Administration for the Construction of Gas-Industry Facilities in Urengoy], long before the development of operations, began preparations for developing the transportation network. Schemes for the delivery of materials and machinery were well thought out, and a potential for the use and interaction of all types of transport, depending upon conditions and the time of year, was called for.

The Yamburg field is located beyond the Arctic Circle. Here the severe breath of the Arctic Ocean is felt constantly. Strong winds blow more than 250 days of the year, summer often is short, and the navigation season lasts only a month and a half. But even in this period, up to 30 percent of the days are stormy. In the summer there is no route other than the water one. Aerial hauling still is not being considered--how much can be delivered by helicopter?

In the summer of 1983 Glavurengoygazstroy began its navigation work. It was clear that this was a test navigation season. It was necessary to verify in practice the river's navigability by ships and to determine the possibility of constructing berths and developing a port activity in the future settlement. Nevertheless, 2,200 tons of freight were delivered to the pioneer base in the summer--housing huts for construction workers and machinery. Then heavy bulldozers, pit drills, pipelinelayers, dump trucks--all were imported over ice roads--all this in order that Mintransstroy [Ministry of Transport Construction] subunits might start building a berth on the Nyudyamongotoyepoka River as quickly as possible.

The winter of 1983-1984 was not an easy one. Fuel had to be delivered to Yamburg over ice roads by gasoline trucks. The effectiveness of this delivery was not great, but there was no other way.

It was necessary to complete erection of the berth by the start of the navigation season. This could not be done without fuel.

Great hopes were placed on the 1984 navigation season. The plan required that 70,000 tons of cargo be hauled to Yamburg by waterway. Special care was exercized in preparing for this period. As a result, the plan was greatly overfulfilled--111,000 tons of cargo were hauled, among which were: 800 tons of metal section, more than 3,700 tons of steel pipe, 3,000 tons of road slab for erecting helicopter pads, 500 tons of cement, 8,100 tons of Arctic diesel fuel, 40,000 tons of sand and gravel mix, two integrated housing settlements for 500 persons each, lumber, metal constructional structure, mineral-wool material and other building materials.

Precision in unloading barges, erecting fuel tanks and operating the whole transportation conveyor line was organized, thanks to the active participation of various construction organizations and the active work of many supervisors.

Not only the rivermen worked at Yamburg during the 1984 navigation season. The aviators extended substantial help. Helicopters constantly provided the settlement with fresh produce, delivered some equipment and transported people.

Thus the experience acquired last summer will allow this year's strenuous tasks to be coped with. During the 1985 navigation season 200,000 tons of cargo are to be hauled.

At present freight for Yamburg flows over ice roads, which start at the Medvezhye field. The maintenance of this ice road, which passes over open territory, involves a number of difficulties.

The road is open to all winds, which sweep it constantly. No little equipment is needed for clearing it. Reliable radio-relay communications should be arranged for the whole route, and mobile shops with sets of spare parts and repair and welding equipment are necessary. All this will greatly raise the reliability of the winter road to Yamburg. It should work without interruption.

UDC 553.002.2/624(571.1)

Very Large Modules Planned

Moscow STROITELSTVO TRUBOPROVODOV in Russian No 1, Jan 85 p 10

[Article by V. V. Nabokov (Sibkomplektmontazh, Tyumen): "Yamburg Requires Attention"]

[Text] Sibkomplektmontazh [Siberian Association for the Erection of Outfitted Structure] is making no small contribution to development of the country's gas industry. Today we can speak with pride about the fact that not one cubic meter of gas has been recovered in West Siberia without its participation. Jointly with SibNIPIgazstroy [Siberian Scientific-Research and Design-Development Institute for the Erection of Gas-Industry Enterprises], it worked on new methods for building up gas fields. They have permitted labor expenditure at the construction site to be sharply reduced and, thereby, the time spent erecting integrated gas-treatment installations at the Urengoy gas-and-condensate field to be shortened. However, the fact is that what was advanced yesterday is out of date today. Thus, for the severe climate of Yamburg, new solutions are required. Specialists of Sibkomplektmontazh have proposed to build Yamburg up with huge modules fully readied at the factory and weighing from 250 to 400 tons. The association has worked out at oil-industry facilities a method for erecting such large modules, having erected several cluster-type pump stations, booster-pump stations, and DE 16/14 boilerhouses.

The essence of the method lies in mounting the equipment, including that for power engineering purposes, on pontoon modules, and, upon conclusion of the assembling operations, the pontoon module is lowered into and transported over the water, and then it is delivered over dry land to the place of installation.

The Yamburg terrain will allow the indicated method to be used. Up to the present time YuzhNIIgiprogaz [Southern Branch of the Scientific-Research and

Design-Development Institute for the Design of Gas-Industry Facilities] has planned corridors for transporting the large modules for the whole Yamburg field. This institute did major work jointly with SibNIPIgazstroy on the design of Yamburg's integrated gas-treatment installations Nos 1 and 2 with the use of large modules.

Beginning this year Sibkomplektmontazh has greatly increased the amount of work done on the delivery of outfitted modules for facilities that are to be erected. The output of large modules is rising sharply.

The collective has been given an important task: to master in a short time the production of large modules in large numbers. However, the production space available to the association is not completely adapted to the manufacture of pontoon-module parts. The construction of a metal structure-plant, where all problems on the manufacture of pontoon modules will be resolved, must be speeded up.

The association is successfully implementing the social program for the 11th Five-Year Plan. Each year at least 23,000 m^2 of housing are being built in Tyumen. However, analysis conducted at the plants indicates that the waiting line for obtaining housing is not being reduced but is increasing. It is being increased not because of new arrivals but because of newly formed families.

And even the amount of housing that plants obtain for assignment consists of only 5 percent of what is introduced. There is one conclusion: expand housing construction for the industrial sphere. By doing so, it will be possible to recruit the additional workers necessary for increasing the output of outfitted-module articles.

The task that faces the association in building up Yamburg is extraordinarily complicated and important. Even in 1985 the association's plants are to manufacture 36 pontoon modules for Yamburg. In order to realize this, a set of measures is necessary, of which the chief one is that of getting qualified workers.

The managers of the design institutes and production collectives still are paying little attention to housing and amenities questions for the buildup of the new fields. The rule should be indisputable: unless housing is built for sheltering the rotating-duty brigades, unless amenities for the workers are built up, and unless efficiency in the life-support systems (GSM [fuels and lubricants], water, electric power and gas) is provided, it will be impossible to proceed to construction of the new production facilities.

The association has developed with its own forces, based on a 1,000-ton pontoon module, a rotating-duty complex for 60 people with full life support. Its manufacture and dispatch by water to Yamburg in July 1985 will be our contribution to solving the labor problem, by providing subcontracting organizations with housing.

Realization of the measures that Sibkomplektmontazh developed for building up the Yamburg gas field requires the active participation of all organizations concerned. Most rapid development of the Yamburg field depends to a great extent upon the coordination and precision of their activity.

UDC 333.332.2

Housing, Municipal Services, Amenities

Moscow STROITELSTVO TRUBOPROVODOV in Russian No 1, Jan 85 p 11

[Article by V. I. Asayenko (Yamburggazpromstroy [Trust for the Construction of Gas Industry Facilities at Yamburg]): "Social and Domestic Living Conditions at the Pioneering Stage of the Yamburg Field's Buildup"]

[Text] The main target for the application of the builders' forces in the West Siberian region during the 12th Five-Year Plan will be the Yamburg gas-and-condensate field, the conquest of which will require a special approach by scientific-research, design and construction organizations. This is caused, on the one hand, by the short time for developing the field and bringing it up to the designed capacity, and, on the other, by the striving to create maximum comfort for working and living and to retain cadres of highly qualified construction workers here for a lengthy time. This is to be done in a region where the cold reaches -60 degrees C, where wind and snow storms rage, where winter lasts from October to June, and where the soil thaws in the summer only from the surface, laying bare the swamps and lakes where, for many hundreds of kilometers, the unpopulated tundra unfolds.

Because of this the master design organization for Yamburg--YuzhNIIgiprogaz--and the institutes SibNIPIgazstroy [Siberian Scientific-Research and Design Development Institute for the Design of Gas-Industry Enterprises], TyumenNIIgiprogaz [Tyumen Scientific-Research and Design Development Institute for the Design of Gas-Industry Enterprises], Lenvodokanalproyekt [Leningrad Branch of the State Design Institute for the Survey and Design of Outdoor Water Mains, Sewer Systems and Hydraulic-Engineering Installations] and Soyuzdorproyekt [State Design Institute for the Survey and Design of Highways] call for the construction of a whole complex of facilities for pioneering development, which will provide for overall development of the field's infrastructure.

The development plan calls for the erection of pioneering housing settlements in the field's industrial-development zone for construction workers, the creation of water-supply systems, and the erection of sewage-purification structures, mobile power plants and communications facilities. An outfitted-module version, made of modules fully readied at the factory, is planned for housing and social buildings and other structures.

Obtaining about 400 m^3 of water per day for household, drinking and firefighting satisfies completely the requirements of the facilities in the first phase of the buildup. The water intake is to come from two sources: in the summer from the Nyudyamongotoyepoka river, and in the winter from the Ob Gulf. In order to accelerate water-line operations, the lines are to be laid on log supports. The reliability of the water-line operation in winter will be insured by electric heating.

The sewage purification structures will consist of modular installations capable of purifying 400 m^3 each of drain water per day and one station, also modularized, which will process 100 m^3 of drain water daily. The completely purified and disinfected effluent will be pumped into a formation or discharged into the river.

Heating of first-phase facilities will be provided by local 2BVK modular boilerhouse installations, which are produced by Sibkomplektmontazh, operate on various types of fuel and have proved themselves well under Far North conditions.

The requirements for electric power will be satisfied by mobile diesel power plants.

The main transport arterials to Yamburg will be waterways and ice roads. In order to provide for responsive transport ties during the initial period, pads for helicopter landing will be built.

Radio-relay lines will provide reliable direct radio-relay communication with the cities of Novyy Urengoy, Nadym and Labytnangi.

Quarters for construction workers during the Yamburg gas-and-condensate field's development period will be organized at a settlement for 1,500 residents, which will consist of a housing zone and a municipal zone.

In the housing zone will be 29 dormitory compartments, each of which will consist of nine housing modules and one bathroom and personal-amenities module equipped with a bath. One compartment is designed to accommodate 36 people. TsUB [all-metal unified housing mobile] modules at four residential areas will have all the necessary life-support systems: heating, sewer, hot and cold water supply, and electricity. The settlement's housing inventory will also include 10 dormitories for 50 residents each, made from the functional VZhK modules. In such dormitories are 25 rooms for two, a room for visitors, a library, an isolation room, a place for table games, a kitchen, a washroom, showers, sauna-baths, rooms for personal hygiene, entrance halls and linen closets.

The settlement will have two dining rooms that seat 60 each, with buffets, cold storage for 100 tons of produce, a bakery, stores for foodstuffs and industrial commodities, and warehouses.

In the communal zone are a boilerhouse, a sewage pumphouse, a water-pumping station, a firefighting reservoir, a diesel power plant and a transformer yard. Reliability of their functioning is insured by a duplication of the basic equipment of the indicated structures.

Twelve 24-unit apartment houses, a cultural and health-improvement complex, and a dining room that seats 250 will be located in the settlement's area of future buildup.

The Yamburggazpromstroy Trust was created specially in 1984 within the Glavurengoygazstroy [Main Administration for the Construction of Gas-Industry Facilities in the Urengoy Area] system, in order to do construction work at Yamburg.

The trust evolved at Yamburg into three general-construction administrations, a mechanization administration, a production-equipment outfitting administration and a motor pool.

The navigation season that ended in 1984 was a reliable base for later successful work by the trust. During the navigation season the trust at Yamburg imported rolled metal section, steel pipe, prefabricated reinforced-concrete products, other building materials and coveralls. Tanks for dispensing thousands of tons of diesel fuel were erected at the fuels and lubricants storage area. Construction machinery and mechanisms, truck and tractor equipment, and operating equipment were delivered.

Temporary settlements have been established now at Yamburg for accommodating a pioneering contingent of engineers, technicians and workers, a base for the trust's subunits has been equipped, boilerhouses and bathhouses have been erected, and communications and television are in operation. Social organizations are functioning in the trust's subunits. People at Yamburg do not feel isolated from the mainland.

However, there are still serious problems in implementing the contemplated social program. The arrival of design and budget-estimating documents was greatly delayed. The designs incorporated large amounts of work that have to be done directly at the construction site. There are difficulties with equipment outfitting, with obtaining box modules, and with the work of subcontracting organizations.

In 1985 the trust is to put a helicopter pad into operation, to build the first section of the pioneer water line, and to carry out preparatory work on sewage purification structures. This will enable the detachment of construction workers who will erect the integrated gas-treatment installation to land. Preparatory work at the site of the first line of this installation is being performed by Nadymgazpromstroy [Trust for the Construction of Gas-Industry Facilities at Nadym]--a veteran of Medvezhye and Urengoy.

11409
CSO: 1822/260

OIL AND GAS

EDITORIAL DISCUSSES CASPIAN OIL PRODUCTION, OBJECTIVES

Baku VYSHKA in Russian 1 Jun 85 p 1

[Editorial: "Caspian Oil"]

[Excerpts] It's been a long time since oil production in the Caspian has grown like it has over this past year, the concluding year of the Eleventh Five-Year Plan period. Just the other day from April 28 Field came still another piece of good news: well No. 109 had just come on line producing at a rate of over 300 tons a day. Now operating in the new field are 21 wells producing some 8500 tons of liquid fuel each day. By way of comparison we could point to the fact that several of the large oil and gas production administrations of the Kaspmorneftegazprom Association taken together are not producing this much oil a day.

Primary emphasis, of course, should be placed on efforts to achieve maximum returns from our geological prospecting and exploration and sharp increases in the rate of exploratory and development drilling. The progress Caspian drillers are making is currently leaving a great deal to be desired. Suffice it to point out that they have fulfilled their four-month drilling plan to the extent of only 79.2 per cent, 61.2 per cent in the case of the target for exploratory drilling.

The root of this problem is to be found primarily in an unsatisfactory operational organization and a decline in the sense of personal responsibility on the part of some managers for the task with which they have been charged. And it is precisely this which can be blamed for the fact that over the first four years of the current five-year plan period we have seen 60 accidents in the course of exploratory drilling alone, which were responsible for the loss of over 60,000 meters of well. In other words, there are many geological problems still going unsolved, not to mention the material loss sustained by the state.

Much remains to be done in the way of raising the technical level of operations in both our new and our old oil and gas fields. We have to learn from the bitter lessons of the past, when in the pursuit of glory and cheap success a number of managers allowed more oil than targeted to be extracted from some wells, which doomed a number of pools to premature exhaustion. But we are nevertheless still getting reports that old mistakes are being repeated and some operations are departing from the intelligent practices which should be followed in exploiting our natural resources.

The attention of party, trade union and Komsomol organizations and industrial managers should remain continuously focused on the technical modernization of our offshore oil and gas production operations. It is exceptionally important that the plant in Baku fabricating supports for permanent deep-water platforms, a one-of-a-kind plant, move faster to bring its new productive capacities on line and get set up to manufacture this product which is so important to the oilfield workers. It is also necessary to give attention to the need of the part of our enterprises for high-capacity new hoists, pipeline layers and fire boats.

Particular attention must be devoted to an effort to maintain the purity of the Caspian Sea and to the conservation of its unique resources. Recent years have seen the accomplishment of a great deal to prevent petroleum products, chemicals, drilling mud and other harmful substances from getting into the water. But we are still far from having done everything we can to eliminate water pollution here entirely. This is not only a major economic problem, but a social problem as well, one which we must tackle systematically and with the utmost persistence.

8963
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OIL AND GAS

BRIEFS

DRILLING OPERATIONS IN EASTERN AZERBAIJAN--From the Kura coast to the foothills of the Great Caucasus Range, the operations sites of the drillers from Ali-Bayramly extend over a distance of more than 100 kilometers. Dozens of shift buses leave Oilmen's Square in Ali-Bayramly each day for fields at Kyurovdag, Mishovdag and Kalameddin. In this the concluding year of the 5-year plan period the Ali-Bayramly Drilling Administration is leading in socialist competition among drillers of the Azneft' Production Association. Responding to the decision of the April Plenum of the CPSU Central Committee with concrete accomplishments, they reported 18 days ahead of schedule their early achievement of the 5-month target for oil wells drilled and turned over for operation. Since the beginning of the year they have drilled 28,000 meters. Sixteen oil and gas wells, four of them at the new Kalameddin field, have been turned over to the field men of the Shirvanneft' Oil and Gas Production Administration. Over a period of only 4 months the commercial drilling rate has increased 21.8 percent. The efforts of the entire drilling administration here are aimed at providing the best assistance to Shirvanskiy oilmen as they strive to meet their annual oil and gas production goals, and as a demonstration of this desire they have resolved during June to turn over two more oil wells and drill another 250 meters. [By N. Ismailov, secretary of the Ali-Bayramlinsk Drilling Administration Party Committee] [Excerpts] [Baku VYSHKA in Russian 28 May 85 p 1] 8963

NEW BELORUSSIAN DEPOSITS DISCOVERED--Geologists of the Belneftegazrazvedka Trust have discovered new deposits of the "black gold" in the Severo-Domanovichi area of Kalinkovichi Rayon. This is the first oil discovered in the republic in the nonstructured intersaline Western Petrikov deposits. [Excerpts] [SELSKAYA GAZETA in Russian 7 Apr 85 p 2] 8963

NEW CASPIAN WELL PRODUCING--Foreman Kyamaltdin Bayramov's bridage operating a well in the deep-water section of the 28 April field marked the 40th anniversary of the great victory with a fitting Stakhanovite effort. Here, on permanent offshore platform No 4, working with their brigade leader, operators Dzhavid Amirov, Khanguseyn Ibragimov and Farkhad Gambarov succeeded in bringing well 136 on line. According to preliminary measurements, it will be producing 300 tons of oil per day from a depth of 3100 meters. The operating stock of field No 8 now comprises 20 wells producing in large quantities. This leading collective in the Oil and Gas Production Association imeni 22d Congress of the CPSU now has over 10,000 tons of above-plan production to its credit. [By V. Goltsev] [Excerpts] [Baku VYSHKA in Russian 12 May 85 p 1] 8963

FIELD EQUIPMENT SHIPMENTS--Baku--Another shipment of oil field equipment recently left the spur line from the Machine-Building Works imeni Lt Shmidt on its way to the oilmen in Western Siberia. This was the first shipment for the second half of 1985. These northern oilmen will be receiving 4800 sucker rods and 8 swivels from Baku, the gas people of Tomskneft' 25 Christmas trees and 1 swivel and all 2 months ahead of schedule. Contract obligations to deliver products to the Komineft' and Tyumen'gazprom associations have also been fulfilled early. Shipments have included 10 Christmas trees, 5 casing heads, 2 rod transporters and other equipment used in gas and oil exploration and production operations. [By G. Abelov] [Text] [Baku VYSHKA in Russian 12 May 85 p 1] 8963

PRODUCTION FIGURES--Neftechala--Field men of the Neftechalaneft' Oil and Gas Production Administration are engaged in a vigorous search for reserves and ways to stabilize oil production levels in old areas. Competing to render a worthy salute to the 40th anniversary of the great victory, they were able to meet their plan targets for the first quarter. They exceed their gas production target by 10.2 percent, their oil production target by 50 tons. The organization is consistently above plan in increases in labor productivity. In this category they are 1.9 percent above target. Consistent performance comes as the result of increased attention to the need to preserve the existing well stock and the implementation of effective geological-engineering measures aimed at increasing the yields from a formation. The first quarter alone saw the introduction of 84 geological-engineering measures, which made it possible to increase oil production by 1.085 tons. A substantial increase was reported from well 1048. Reperformation opened the seventh horizon of the producing formation, at which point the well began producing at a daily rate of 10-12 tons of oil. some 5-6 tons of liquid fuel have been added to daily production from wells 492 and 1018 in the Neftechala area, 2-3 tons from wells 443 and 456 in the Khilly area. Well 432 in the older area is producing the high rate of 30-32 tons a day and following reperformation has been brought to the third horizon of the producing formation. Acid treatment of the bottom-hole zone, changeovers to operations with deep-well pumps among others have also proved effective operational changes. [By S. Garayev] [Excerpt] [Baku VYSHKA in Russian 19 Apr 85 p 2] 8963

NEW GAS FROM KAMCHATKA--Petropavlovsk-Damchatskiy--With well 5, drilled in what is referred to as the Kolpakovskiy Depression on the western coast of the peninsula, now producing at a rate of 282,000 cubic meters a day, even geological experts who are cautious in their estimates are already speaking of the gas on Kamchatka as being present in commercial quantities. This particular deposit was initially identified by theoretical analysis: On the basis of comparisons of the geological structures of Kamchatka and Sakhalin and the theory that western Kamchatka and eastern Sakhalin had formerly formed edges of the Sea of Okhotsk platform, experienced prospectors of the Sakhalingeologiya Association began a search for areas around the peninsula which were similar in structure to those on Sakhalin which have been producing oil for over half a century now. Computations led them to the Kolpakovskiy Depression, where the first wells were drilled in the Kshukskaya area. Confirmation of forecasts came at the end of last year in the form of well 8, which produced gas flowing at a rate of 128,000 cubic meters a day from a formation depth of 1200 meters. The fifth well confirmed the industrial importance of the deposit once again this year. [By V. Komarov] [Text] [Moscow SELSKAYA ZHIZN in Russian 28 Feb 85 p 1] 8963

NEW NEFTECHALA OIL--Well 1067 has been producing at a rate of 30 tons a day from one of the oldest deposits in the republic at Neftechala. Drilling was completed a month ahead of schedule by a brigade headed by A. Salimov of the Prikurinskoye Drilling Administration. Testers under the direction of T. Magerramov distinguished themselves in the process of bringing the well on line. The production from well 1067 demonstrates that the Neftechala area still contains reserves of this natural fuel. [By A. Akhadov, senior geologist, Neftechala sector of the Prikurin Drilling Administration] [Text] [Baku VYSHKA in Russian 30 May 85 p 1] 8963

EFFICIENT TANK CAR HANDLING--Cheboksary--Workers at the oil facility in Cheboksary have performed smoothly and efficiently even during the winter with all its drifting snow. Tank cars have been kept moving in accordance with a rigorous schedule. The railroad has presented them with awards for their role in reducing norms for car idle time. A close cooperation has been established between the railroad and the bulk plant. The railroad gives its partners plenty of advance notification of the arrival of each new group of cars, while the latter have been able to get them unloaded quickly and efficiently. The improvements at the enterprise have reduced the period of time required to process the cars. So it now takes less time to get them unloaded, and this is now done more carefully and efficiently than before, which has accounted for substantial reductions in losses of petroleum products. [Text] [Moscow SELSKAYA ZHIZN in Russian 7 Mar 85 p 1] 8963

SWAMP VEHICLE--The Neftetransmash Works is now making the Tyumen swamp vehicle for oil field operations. This series-produced vehicle can carry 40 tons and is based on the K-700 tractor. [Text] [Moscow PRAVDA in Russian 11 Mar 85 p 2] 8963

NEW PROSPECTING SHIP--The geological exploration expedition based in Murmansk has received another sophisticated new scientific research ship. The ship, the Geologist Dmitriy Nalivkin, built in Finland in accordance with a Soviet design, will be operating in the Kara and Barents Seas. Here it will be supporting the search for new oil and gas deposits, but final adjustments have first to be completed on a variety of electronic equipment and geological-geophysical research apparatus. [By N. Astafyev] [Excerpts] [Leningrad LENINGRADSKAYA PRAVDA in Russian 5 Mar 85 p 1] 8963

THERMAL ACID TREATMENT INTRODUCED--Okha, Sakhalin Oblast--It will now take the oil well maintenance people much less time to reinforce a shaft. Field men have been able to cut down time between maintenance periods with the help of the Sakhalin Petroleum Research and Design Institute. "This method of speeding up the shaft reinforcement process was developed not very long ago by our laboratory and was first used at the Okha field," Yu. Mavrinskiy, deputy director of the institute, pointed out. "It is based on thermal acid treatment of what are called the bottom-hold zones. The new method has helped stabilize operations in fields where oil production is lower." [Text] [Moscow SELSKAYA ZHIZN in Russian 13 Apr 85 p 1] 8963

NEFTECHALA PRODUCTION--Jeftechala--Foreman Seidgasan Kyazimov's brigade from the Prikurinskoye Drilling Administration was one of the first in the drilling

administration to report fulfillment of 6-month targets. Since the beginning of the year the brigade has drilled 2400 meters. [By D. Grezalov, worker, Prikurin Drilling Administration] [Excerpt] [Baku VYSHKA in Russian 18 May 85 p 1] 8963

OPERATIONAL PERFORMANCE--Ali-Bayramly--The Ali Bayramly office of the Azneft' Association is now operating from its June calendar. Two rigs above and beyond what was called for in the plan have been put up at sites in the Kura lowland. Labor productivity rose 8 percent above the plan figure over a 4-month period, with operational costs down substantially as well. Each one of these collectives turned over five platforms to the drillers. At the same time they achieved considerable savings in materials. [By A. Babayev, retired oil worker] [Excerpts] [Baku VYSHKA in Russian 18 May 85 p 1] 8963

OFFSHORE PRODUCTION UP--Permanent offshore platform No 2 in the 28 April field has brought another well, 110, into production. According to preliminary measurements, it will be producing over 300 tons a day from a depth of 3346 meters from the "break" formation. The well was completed ahead of schedule by a brigade under the direction of foreman Dashdamir Abdurakhmanov, who was recently awarded the Order of the Red Banner of Labor, and Guseyn Nabiyev of the Bukhta brigade led for foremen Mamedagi Aliyev and Gasanbaly Isayev, these explorers met their drilling rate target by 150 percent and reported fulfillment of 6-month targets ahead of schedule. This collective has been responsible for drilling 6 of the 12 wells on the second permanent platform. They have all been turned over to the production people ahead of schedule with production running at high levels. Intensive drilling in this promising field is helping accelerate the increases in recovery rates. Suffice it to say that over the past 2 years oil production here has more than tripled. [By V. Goltsev] [Text] [Baku VYSHKA in Russian 4 Jun 85 p 1] 8963

DEEPEST WELL IN AZERBAIJAN--Baku--Drillers of the AZNEFT' Association's Kyursangyanskoye Drilling Administration have begun work on what will be the deepest "dry land" well in Azerbaijan. Planned to extend down more than 6 kilometers, this well will support the study of the formations at a promising site the geologists have identified. The drilling rig consists of a high-strength derrick and a machine room equipped with automatic equipment. Geologists will be able to bring up a rock sample every 45 meters for scientific study. A Start-2 geological engineering monitoring station has been built at the well for this purpose. [By D. Melilcov] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 23 Mar 85 p 2] 8963

NEW KHILLY PRODUCTION--New well 417 at the old Khilly site has yielded a rich flow of oil. Operations to the credit of the 12th 5-Year Plan are also underway at development well 416 at the same site. Roughly half of the planned drilling has been completed ahead of schedule. In fulfilling their socialist obligations, the brigade here has resolved to turn one more well over to the field men of Neftechalaneft's oil and gas production administration before the end of the year. [By S. Grarayev] [Excerpts] [Baku VYSHKA in Russian 14 May 85 p 1] 8963

EXPLORATORY DRILLING AT BULLA MORE--Exploratory well 53 has come on line at the Bulla-More site. From a depth of 5615 meters it is producing more than 250,000 cubic meters of gas and 30 tons of condensate a day from the seventh

horizon of the producing strata. Of what economic importance is this well? The new well has shed light on the nature of the geological structure of the site down to the 6-kilometer mark, and when the Bulla-More Oil and Gas Production Administration imeni 50th anniversary of the USSR brings this well into production it will help stabilize gas production here, which has lately been declining. A brigade under the direction of foremen Mamed Kalilov and Fakhraddin Movsumov are drilling another exploratory well, well No 71, to a depth of 6300 meters at the same Bulla-More field. The task here is to find the eighth horizon, confirm the type of deposit and establish the nature of the saturation of the section. The drillers have undertaken the obligation to bring this well into production a month ahead of schedule. [By R. Andreyeva] [Excerpts] [Baku VYSHKA in Russian 30 May 85 p 1] 8963

CASPIAN PIPELINE CONSTRUCTION--From the Islets to the Island. Construction has begun on a pipeline for the new April 28 field, the deepest in the Caspian, where the first 14 wells, built on four permanent platforms, are now producing several thousand tons of top-grade oil a day, more than the entire on-shore field. The oil from the islets does not go directly to shore. The pipeline under construction, like the first two of those now in operation, will lead to another, "big island," the legendary Neftyanyye Kamni. So this city on steel legs is not only an oil field, but a unique transshipment point as well. [Text] [STROITELSTVO TRUBOPROVODOV in Russian No 2, Feb 85 p 8, from PRAVDA]/COPYRIGHT: Izdatelstvo "Nedra", Stroitelstvo trwboprovodov", 1985/ 8963

PREFABRICATED SURFACING--At the request of the oil industry, scientists of the bridging department of the construction-engineering institute in Tomsk have developed a collapsible, prefabricated road surface which will be used in making emergency pipeline repairs. The new surface has been tested under operational conditions during repairs on the Aleksandrovskoye—Tomsk—Andzhero-Sudzhenskoye oil pipeline in the marshes of Parabelskiy Rayon. Annual savings from introducing this innovation will run to some 800,000 rubles. Together with experts from the oil industry, institute scientists are also working on designs for work sites using the same surfacing which can be set up on marshy terrain. Helicopters could also land on the new surfaces. [Text] [STROITELSTVO TRUBOPROVODOV in Russian No 2, Feb 85 p 8, from KRASNOYE ZNAMYA, Tomsk]/COPYRIGHT: Izdatelstvo "Nedra", Stroitelstvo trwboprovodov", 1985/ 8963

CSO: 1822/262

STUDY OF GEOLOGY OF COAL AMONG CEMA COUNTRIES

Moscow EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV SEV in Russian No 2, 1985

[Article by Jan Krupa, CEMA Secretariat, and Nadezhda Zheleznova, USSR Zarubeshgeologiya [All-Union] Scientific Research Institute for Geology], and Josef Pozitsky, Polish Geological Institute: "A Study of the Geology of Coal: Some Results"

[Text] Many years of scientific and technical collaboration among the CEMA member countries in studying the geology of coal, with the goal of broadening their fuel and energy base, were crowned in 1984 by publication of important summary documents. most important among them is an overview map showing the coal content of fields in the European socialist countries (Bulgaria, Hungary, the GDR, Poland, Romania, the western regions of the USSR, the CSSR and the SFRY), with a scale of 1:2,500,000, a monograph* and an atlas of maps showing the coal fields and deposits in the CEMA member countries and the SFRY.

Recently, in connection with increased world requirements for raw material resources and higher prices for petroleum and gas, many countries of the world have expanded the mining and use of coal as a source of energy and as a technological and multi-content raw material. Compared with 1970 the share of fossil coals in the world fuel and energy balance grew from 18 to 35 percent; their projected reserves have reached 11,000 billion tons and explored reserves -- 3,700 billion tons.

The position of the CEMA member countries with regard to prospects of the coal industry remains constant. For many years they have been directing their efforts toward the development of national raw-material supplies of coal and have been devoting much attention to evaluating coal reserves suitable for use at present-day technological and economic levels. Coal, along with petroleum, gas and other types of energy resources, now and for the foreseeable future will remain one of the important sources of energy in CEMA member countries. The reasons for this are the availability

* "Coal Fields and Deposits of the CEMA Member Countries and the SFRY" ["Ugol'nyyee basseyny i mestorozhdeniya stran-chlenov SEV i SFRYu"] Moscow, CEMA Secretariat, 1984, 508 pp

of significant coal reserves accessible for exploitation, their location in regions with high population density and multi-purpose utilization of these coals.

In 1982 coal and anthracite mined in the CEMA member countries amounted to 716.8 million tons while dense and soft lignites mined came to 660.3 million tons. In all the fraternal countries real prospects exist for expanding the coal raw material base by exploring and surveying fields, deposits and promising areas which contain hard, mainly coking coals and have the most favorable mining and geological bed locations, as well as lignites suitable for open-pit mining. As a result of effective geological investigations, new coal fields and deposits have been discovered and surveyed; mines and open cuts equipped with modern equipment are also being put into operation.

The CEMA member countries possess entensive geological supplies of coal, comprising more than 7,690 billion tons, or 51.9 percent of total world geological reserves. Producing and surveyed coal reserves ensure the existing mining level -- 1.4 billion tons or 38 percent of world population.

About 30 large and 1600 smaller coal fields and deposits have been discovered, surveyed and evaluated within the territory of the CEMA member countries. The following are among the most significant fields which now or in the future will supply the coal industries of these countries: In the USSR (in billions of tons) there are: the Tunguska (2,299), Lena (1,647), Kansk-Achinsk (637.8), Kuznetsk (636.9), Pechora (265), Donetsk (141), Karaganda (45), South Yakutia (44) and Ekibastuz (9.66); in Poland, the Upper Silesian (109.6 tons) and the Lublina (60.8) fields; in the Mongolian Peoples Republic, the Tavan Tolgoy (9.6); in Hungary, the Mechekskiy (3.8) and in Romania, the Petroseni (about 2.5).

However, although coal resources as a whole are relatively satisfactory, not all CEMA member countries are equally supplied with coal of such scarce grades and types as, for example, coals for coking, for gasification, for obtaining liquid fuels, rare and dispersed elements. There are also unequal possibilities for processing coal by the most economical open method. Therefore, joint investigations take account of national peculiarities in development of the coal industry as well as of general world trends, and find solutions for the entire series of urgent problems connected with improving the structure of the fuel and energy balance and supplying the economies of the fraternal countries with high quality coals and lignites.

The CEMA Permanent Commission for Collaboration in the Field of Geology is devoting a great deal of attention to the solution of problems of evaluating the fuel and energy potentials of the CEMA member countries, including their raw-material coal potential. Recently, effective geological studies to calculate prospective reserves of coal and evaluate their quality have been carried out, special features in geological and mining work conditions have been determined and methods of forecasting, exploring and surveying have been improved, particularly with regard to deep-lying beds of coking coal and also lignites to be worked by the open method.

The achievements of scientists and practical workers of the CEMA member countries in developing a methodology and recommendations for geological and industrial surveying and evaluation of coal and anthracite fields and deposits are being introduced in the course of geological survey operations. The results of research based on multilateral collaboration are being widely used in drawing up the fuel and energy balances of the CEMA countries. The above-mentioned map of coal-bearing areas, the monograph and the atlas are also a great help in this. They give a sufficiently complete characterization of the coal raw-material potential of the CEMA member countries and the SFRY and are serving as a starting point for competent organs and organizations in determining the general directions for development of the coal industry and for solution of such more particular problems as evaluating the degree to which coal fields and deposits have been investigated, clarifying prospects for changing the quality of coal and planning further geological survey operations for coal.

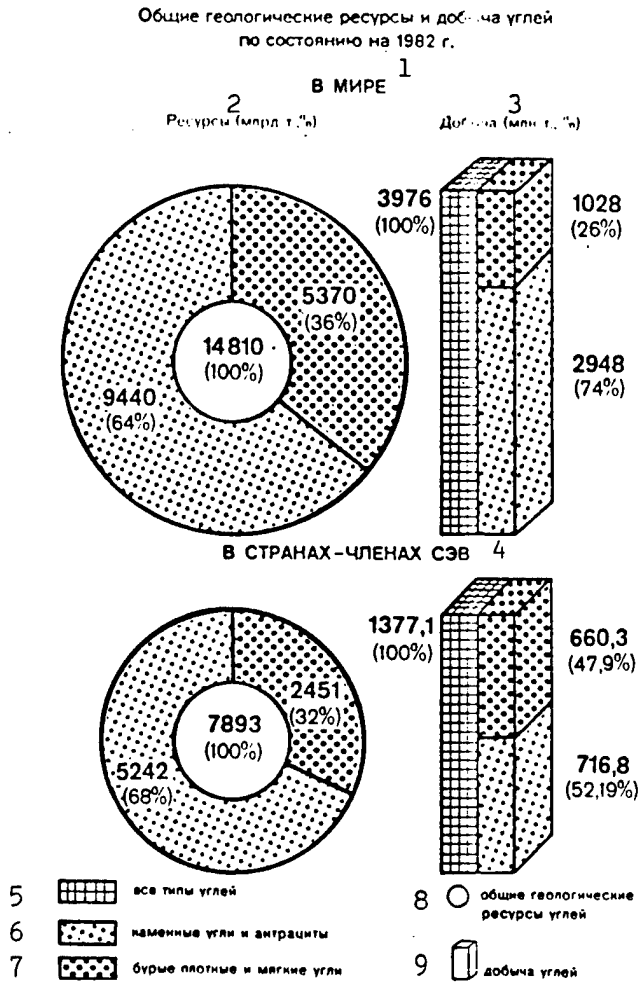
The overview may was created in 1984 by the All-Union Scientific Research Institute for Foreign Geology in accordance with a decision of the CEMA Permanent Commission for Collaboration in the Field of Geology. It shows for the first time the location of all major coal fields, deposits and coal-bearing areas within the borders of the territory being studied, breaking the fields and deposits down by coal type into anthracites, hard coals and lignites, indicating dense and soft lignites; the extent to which coal-bearing areas have been surveyed and the most significant indicators of coal content and quality are also shown.

The monograph on the coal fields and deposits of the CEMA member countries and the SFRY is an important basic study of the geology of coal. It takes a scientific and practical look at common problems, at international classification of coal fields and deposits and at the achievements of the CEMA member countries and the SFRY in improving methods of evaluating prospective resources of coal, as well as at the results of calculating their total geological resources and reserves.

General principles of coal accumulation are characterized for the territory of each country and, for the leading coal and lignite fields, geological structure, coal content, coal quality, mining and geological conditions of extraction, the status of resources and reserves of coal and possible future directions of geological survey work are discussed. It is the first time in the entire history of the multifaceted cooperation of the CEMA member countries that such a work in the study of the geology of coal has been put out.

Also published for the first time is the unique "Atlas of Maps of the Coal Fields and Deposits of the CEMA Member Countries and the SFRY", which contains a set of maps developed on a single methodological basis for 150 principle coal fields and deposits, maps of projected coal content and of the extent to which reserves and resources of coals have been studied and also of the quality and degree of metamorphism of coals.

Total Geological Resources and Mining of Coal as of 1982



Key:
1. Worldwide
2. Resources (billion t /%)
3. Mined (billion t /%)
4. CEMA member countries
5. All types of coal
6. Hard coals 7 anthracites
7. Dense & soft lignites
8. Total geological resources of coal
9. Mining of coal

Within the boundaries of the coal fields and deposits, sectors are delineated for open-pit operations; the depth and size of coal seams and basic indicators of the quality of coals are shown and areas and sectors with high contents of sulphur and harmful components are designated.

The scientific and technical achievements attained by the CEMA member countries as a result of multilateral research during 1976 - 1984, which find expression in the publication of large and practically important works, in the development and unification of methodologies and in calculations of predicted coal resources, are a reliable basis for the further development of collaboration among the CEMA member countries in studying the geology of coal.

13032
CSO: 1822/303

COAL

UDC 553.94 (571.53)

NEW COAL DEPOSITS IN IRKUTSK OBLAST

Moscow RAZVEDKA I OKHRANA NEDR in Russian No 2, Feb 85 pp 24-26

[Article by N. A. Popova, of the Irkutskgeologiya PGO (Production Geological Association): "New Coal Deposits in the Irkutsk Oblast"]

[Text] In connection with the fact that operations in the Cheremkhovo Coal Field are drawing to a close, and that the possibilities for further increases in the capacities of the mining enterprises in the Azeyskiy Lignite Field are limited, the Irkutskgeologial Production Geological Association is faced with the task of preparing new mines, favorable to being mined by the open-pit method in these areas. As a result of the exploration and prospecting efforts carried out in recent years, we have been successful in detecting, and to a certain extent prospecting new coal-bearing areas, the development of which may provide a replacement for the capacities of the open pit mines of the Cheremkhovo Field, which are dropping off, and which will bring about a considerable expansion in coal extraction in the basin's western regions, to which first and foremost belong the Voznesenskiy and Ishideyskiy fields.

The Voznesenskiy Field is situated 25-30 miles to the south of the Cheremkhovo Field. During 1976-1980 the field underwent thorough exploration and preliminary prospecting. Based on the results of these efforts, Vostsibgiproshakht [Eastern Siberian State Mine Planning Institute] drew up a TEO [Technical-Economic Substantiation], and using this as a basis USSR MUP [Ministry of the Coal Industry] in 1981 approved the provisional conditions and made recommendations regarding the organization of detailed exploration of the areas favorable to open pit mining development.

The field is confined to the gently inclined northeastern limb of the Sayan trough. The presence of coal is associated with the Cheremkhovo Suite deposits, in the section of which from one to four coal seams of working thickness are encountered. With regard to geologico-structural position and geographical-economic conditions, the field is separated into three sections. The Motovskiy and Parfenovskiy sections occupy the water-dividing uplands on the left bank of the Bolshaya Belaya River and the Voznesenskiy section is situated in the low and swampy interfluvian area between the Bolshaya Belaya and Malaya Belaya rivers, and this has determined its more complex hydrogeological and hydrological conditions, in comparison with the other two sections.

In the Motovskiy section, which is the most favorable for first-phase development, there are, as a rule one, and more rarely two horizontally-occurring seams present in the cross-section of the coal-bearing deposits. The thickness of the main lower seam varies from 1 to 7 m, and the overlying lenticular seam reaches 2-3 m. The average total thickness of the working seams is 3 m. The seams are of complex structure. The Parfenovskiy section has been studied with less reliability, and the overall thickness of its working seams come to about 4 m. The depth at which the seams in these two sections occur varies from zero (outcroppings on the slopes of the divides), to 100 m in the most uplifted areas of the topography. The average depth has been estimated at 30-40 m.

In the Voznesenskiy section the coal seams plunge gently in a southwesterly direction (toward the area of the Sayan trough), and in this connection they branch off, and the number of working seams increases to five as opposed to one or two in the northeastern part of the section. The aggregate thickness of the coal seams reaches 10-14 meters. Their depth of occurrence varies from 10-15 m to 180 m and more in the southwestern part of the area.

The field's coals are of medium ash content, are basically low in sulfur, are similar in quality to Cheremkhovo coals and belong to gas groups G6-G13 (table). They are a highly calorific power-generating fuel, and can replace the Cheremkhovo coals in all areas of demand. In the Voznesenskiy Field, the areas are suitably contoured for open pit operations with total reserves of 560 million t, and of these a single contour has been separated in the Voznesenskiy section with reserves of 330 million tons, and the remaining reserves are distributed in four discrete contours in the Motovskiy and Parfenovskiy sections.

The technical-economic substantiation drawn up by Vostsibgiproshakht determined the field's open-pit mine fill capacity to be 10.5 million t. The average operational stripping coefficient around the section is 5.9 m^3/t, the production cost to extract the coal has been appraised at 4.96 r/t, and the total cost, considering outlays for enrichment of 7.71 r/t (the production cost for the Cheremkhovo Open Pit Mine comes to 4.47 r/t). At the high-priority Motovskiy section the potential productive capacity has been established at 2.5 million t. When developing it as part of the Cheremkhovo Open Pit Mine, the full prime cost for coal for the section will increase to 5.77 r/t to support the capacity of the latter.

Considering that there are no other reserve areas for the Cheremkhovo Open Pit Mine, and its capacities will drop off as soon as 1987, a detailed exploration of the Motovskiy section was carried out in 1981-1982; coal reserves suitable for open-pit mining amounting to 112 million t were confirmed in 1983 by USSR GSK [State Commission for Stockpiling Useful Minerals].

The Ishideyskiy Field is confined to the southwestern limb of the Sayan trough, and is located 90 km southwest of the Azeyskiy section and within 60 km of the Mugunskiy lignite fields. Detailed exploration of the first sections of the open-pit take have been completed. The commercial coal content here is

associated with the lower horizons of the Cheremkhovo suite, the deposits of which plunge gently to the northeast at an angle of 2°-5°. On the scarp of the flexure which gives complexity to the southwestern limb, the angles of dip attain values of 10°-15°. In the suite's cross section, there is a single thick coal seam of complex structure, which branches along the dip into 2-4 independent seams. Their total thickness reaches 20-23 m, with an average of 12 m, and their depth of occurrence varies from 5 m on the upthrust side of the flexure to 190 m on the subsident side.

The coals of this field are long-flame, have medium ash content and are basically low in sulphur, and an increase in the sulfur content of up to 3 percent and more (see table) has been observed in local sections in the lower seams. In this field, in accordance with a limiting stripping coefficient of $15m^3/t$, an open pit take with reserves of 800 million t has been separated, and 150 million of these tons can be worked out at an average limiting stripping coefficient of $1.25m^3/t$. In 1983, the USSR State Commission for Stockpiling Useful Minerals confirmed reserves of 471 million t.

The Technical and Economic Substantiation validates that the field's open pit The technical and economic calculations which were made based on a median commercial stripping coefficient of 3.87 m^3/t showed that the production cost for mining comes to 3.43 r/t, and the total cost of cleaned marketable coal comes to 5.51 r/t.

In the southern Tunguska River basin, the prospecting evaluation of the Zelidinskiy section, which is part of the Zheronskiy Field, and is located within 25-60 km to the north of the city of Ust-Ilimsk on the right bank of the Angara, has been completed. The field has been considered as the site for a possible center from which to supply fuel to the area's enterprises, which presently use imported Krasnoyarsk brown coals. The commercial coal seams are confined to the highs of the Katskiy suite of the Carboniferous Period, and the lows of the Burguklinskiy suite of the Permian Period. The deposits occur for the most part above gently sloping intersecting intrusions of trap-rocks, and where there are washouts they are overlain with the tufogenic-sedimentary deposits of the Korvunchanskiy suite, of the Triassic Period. Here and there they are breached by the trap-rock bodies. There are five coal seams in the section, of which one or two have basic commercial value. Their total thickness reaches 17 m, with 5-6 m as the average. The working seam of the Katskiy suite is relatively uniform in thickness (2-4 m), but the upper Burguklinskiy seams vary in thickness and structure.

The seams sink to the north-northwest at an angle of 2-3°. The depth of their occurrence has been determined by the present-day topography and varies from zero to 160 m. As a result of contact metamorphism and varying degrees of oxidation, the coals of this field represent varying grades from D to T and A. They are medium-ash, low-sulfur coals, and either do not cake or cake very poorly. The coal reserves which are suitable for working by the open pit method, are estimated to total out at 550 million t for all sections of the Zheronskiy Field, and of them 150 million t have undergone preliminary prospecting. The technical and economic calculations used to substantiate the temporary conditions were worked up by Vostsibgiproshakht for an open-pit mine with

a capacity of 5 million t at an average stripping coefficient of 6.8 m^3/t. The total cost for mining and processing the coal at the first Zheronskiy section has been set at R7.24/t, with a prime extraction cost of R6.6/t.

On the basis of the Technical and Economic Substantiation, the USSR Ministry of the Coal Industry has recommended a thorough exploration of the top priority sections of the field, and this is presently under way. The results of recent prospecting and exploratory efforts have made it possible for the Irkutskgeologiya Production Geological Association to plan the further development of geological prospecting investigations and to orient them toward preparing the fields for open-pit mining.

Indicators	Fields			
	Inshideyskiy	Voznesenskiy	Cheremkhovo	Zheronskiy
W_{max}	15,7	9	10	19
A^s_{coal}	11,8	17	17	18,3
$A^s_{rock\ mass}$	16,7	28,8	28,8	25
S^s_{ob}	46	46	47	33
C^g	76,3	80	77,9	80
H^g	5,4	5,8	5,9	4,5
Y_{mm}	0—6	11—10	8	0—6
T^g(resin)	11	12--16	12,2	3
Q^t_b	7500	7900	7900	7750
Q^r_n	5200	5500	5070	4630
Grade of Coal	D	G6— G13	G6— G13	D, T, A

Table. Comparison of Field Parameters

Key: A--
B--
C--
D--
E--
F--
G--
H--
I--
J--
K--

12659
CSO: 1822/267

COAL

BOOK ON LOW-WASTE COAL EXTRACTION METHODS REVIEWED

Kiev UGOL UKRAINY in Russian No 5, May 85 p 45

[Review by M. P. Zborshchik, candidate of technical sciences at the DPI [Donetsk Order of Labor Red Banner Polytechnical Institute, of book "Malootkhodnaya Tekhnologiya Dobychi Uglya" [Low-Waste Coal Extraction Procedures] by V. Ye. Zhukov, V. V. Vystorop, A. M. Kolchin and Ye. V. Grigoryuk, Tekhnika, Kiev, 1984, 144 pp: "Criticism and Bibliography: An Extremely Timely Book"]

[Text] The problem of making full use of Donbass coal industry wastes is attracting the ever-more constant attention of scientists and administrators of industrial and public organizations. Over three billion t of rock have been accumulated in the makeup of these wastes, and this volume increases yearly by 120-130 million tons; around $6 \cdot 10^9$ m^3 of gas are discharged into the atmosphere and 800 million m^3 of mine water run off into settling tanks, reservoirs and rivers. This quantity of wastes, which are taken out of our mines, not only use up massive material and labor outlays, but have a negative effect on the region's ecological balance as well. In recent years low-waste and no-waste coal-extraction procedures have been developed which provide for leaving the rocks in the mines, and for effective methods for using the gas and mine water. Admittedly, the extent to which these problems have been resolved is still far from having met present-day requirements, the results of the efforts made in this area are being elucidated in uncoordinated fashion and there is no information source where practical achievements would be set forth in correlation, and where methods would be outlined for the continued improvement of low-waste coal-extraction procedures.

This book is the first publication which examines methods by which the coal industry might change over to no-waste extraction methods. An important circumstance, which makes the book so important and useful is its thorough approach to the problem, which approach has its basis in a massive amount of factual material. The book's virtue also lies in the fact that, parallel with its presentaton of designs which have been approved in practice, it examines prospective scientific and technical treatments now in the developmental stage as well, the introduction of which, in the authors' views, should effect a considerable influence on solving the problem. The book presents the most progressive engineering schemes for using coal industry wastes, the rational parameters of which are given and the technical and economical indicators of which are defined.

Chapter 1 is given over to the problems of reducing the volume of rocks removed from the mines by using them to fill in the worked-out spaces. The book gives a quite adequate elucidation of the method by which the rocks are treated (crushed) so that air lines can be used to move them into the fills. The book presents operating diagrams which show how the crushing-preparation complexes work, as well as the areas in which they are most efficiently used.

In connection with the fact that additional capital investments are required for the low-waste coal-extraction procedure which utilizes the filling of the mines' worked-out spaces, the book first examines those schemes which call for the use of the crushed mine rocks to solve complicated engineering problems, i.e. to prevent dangerous deformations in the earth's surface, interior mine fires and the development of formations with complex mining and geological conditions. This makes it possible to obtain an intermediate economic effect from the removal of coal saved beneath the protecting surface facilities, to improve the condition of the development seam workings and to develop the reserves found in seams having unstable overhead surfaces etc. The designs in this chapter which show the procedures used to mine coal without using people, deserve attention. By this method, the fill mass derived from the mine rocks is used to support the roof. By doing so, these rocks are used to solve an important social problem, i.e. to free people from heavy work in the constricted conditions of the breakage face where the seams are thin, or extremely thin. The elements of all the engineering schemes considered are given in full detail, technical and economic calculations are presented and there is a list of the equipment used as well as its parameters.

A separate subchapter shows the organization and procedure for raising the protective belts of rock in the development seam workings being mined around the area of the breakage face workings. Experience from the imeni Stakhan and the Komsomolets Donbassa mines has shown that using rocks for these purposes is a solution which shows a lot of promise, especially for the deep horizons. The practice of the Komsomolets Donbassa Mine has confirmed that even partial use of the rocks, if it is meant to neutralize the dangerous development of rock pressure, provides an economic effect and improves the work of the enterprise within the industry.

The sources for the liberation of gas, and its use as fuel, and a list of control and measuring devices used to monitor methane content are shown in Chapter 2. The experience gained in using methane for fuel, in particular in boiler houses, which utilize up to 25 percent of the recovered gas, is given a place of importance in the book.

The state of affairs regarding mine water is somewhat worse. A good part of Chapter 3 is given to the purification of mine water prior to its being used for technical needs or its being discharged into settling tanks, reservoirs or rivers. The fact that the problem of water purification is given such prominence in the book is in order, inasmuch as this water presents a threat to plant and animal life. The book gives a detailed description of the procedures and equipment used in the purification schemes. A separate subsection is used to show the operational parameters of the water purifica-

tion installations in operation in Donbass mines. Experience shows that all the designs needed to set up a system of water handling facilities which would partially use mine waters are available.

The book is richly illustrated and puts a great deal of emphasis on the practical implementation of low-waste coal-recovery procedures. This book is of interest to coal industry engineering and technical personnel, and would be useful to students of mining VUZ's, and is a timely and important book, as well.

12659
CSO: 1822/267

COAL

UDC 622.011:65.012.45

SYNOPSES OF ARTICLES IN UGOL' UKRAINY, MAY 1985

Kiev UGOL UKRAINY in Russian No 5, May 85 p 47

GREETING THE 50TH ANNIVERSARY OF THE STAKHANOVITE MOVEMENT

[Synopsis of article by Yu. G. Pashchevskiy, pp 6-7]

[Text] The part played by the TsBNTI [Central Scientific-Technical Information Bureau] in preparation for the Stakhanovite Movement's anniversary celebration. Practices, reviews and competitions.

UDC 622.28.004.5

SUPPORTING WORKINGS IN COMPLICATED MINING GEOLOGY CONDITIONS

[Synopsis of article by V. A. Polukhin, V. N. Ostapenko and N. A. Fedosenko, pp 8-10]

[Text] The disposition of workings when using varying methods to prepare and work cutting sections in a single seam, which dispositions insure the satisfactory state and the repeated use of the workings while completing work on associated cutting sections. 2 illustrations. 1 reference.

UDC 622.011.54:622.063:622.023.62

THE EFFECTIVENESS OF WORKING SEAMS IN THE MINES OF THE DONBASS' CENTRAL REGION

[Synopsis of article by O. V. Kolokolov, A. M. Kuz'menko and Yu. V. Vasil'yev, pp 10-12]

[Text] Selecting a rational direction for the development of mining operations in the field of shaft mining and in the region as a whole, with account made of the conditions of mining geology is an unused reserve for improving the efficiency in the development of the seams of the Central Donbass region.

UDC 622.834.52:622.831.031

ROCK DISPLACEMENT ALONG AN ESTABLISHED BREAKAGE FACE LINE

[Synopsis of article by A. F. Borzykh and V. A. Tynyanyy, pp 12-13]

[Text] Statistical dependence used to forecast the displacement of lateral rocks on a breakage face line through time. A methodical approach to determining the extent of dampening of these displacements during the development of gently-sloping seams in Donbass mines. 1 table. 1 illustration. 1 reference.

UDC 622.02:532.2/.8

DETERMINING THE RIGIDITY OF YIELDING SUPPORTS OF DEVELOPMENT WORKINGS

[Synopsis of article by A. P. Maksimov, A. N. Shashenko and A. A. Zholob, p 14]

[Text] Results of an analytical determination of the rigidity of yielding supports used in development workings. Calculation of loads on the support and the extent of its pliability. 3 references.

UDC 622.234.5:622.031.22

THE TECHNOLOGY FOR WORKING EXTREMELY THIN SEAMS WITH HYDRAULIC MONITORING UNITS

[Synopsis of article by Ye. S. Luk'yanchenko, L. G. Semenov and L. Ye. Luk'yanchenko, pp 15-16]

A technological scheme for working an extremely thin seam during the simultaneous operation, on the roof, of three AGS [automated gas-analysing system] hydraulic mining giants. Developing a section with plans which reduce the volume of development work. 5 illustrations.

UDC 622.831"313"003.13:622.142

THE NATIONAL ECONOMIC EFFECTIVENESS OF EXPLORING FOR BROWN COAL IN THE DNEPROVSKIY BASIN

[Synopsis of article by V. P. Kucheryavaya, pp 17-18]

[Text] An analysis and evaluation of the economic effect of exploring for coal in the Dneprovskiy Lignite Basin, and methods for its improvement. 1 reference.

UDC 622.673.2.003.13

THE ECONOMIC EFFECTIVENESS OF IMPROVING THE PROCEDURE FOR ERECTING TOWER-TYPE HEADFRAMES

[Synopsis of article by Ye. T. Mitasov, A. P. Bondarenko and V. G. Krytov, pp 18-19]

[Text] An efficient method for replacing above-minehead headframes by using the slide-over method. Advisability of this method is based on the example of the Artemugol' Association's imeni N. Izotov Mine. 1 illustration.

UDC 622.232.72

THE VK NARROW-GRAB MINING CUTTER-LOADER

[Synopsis of article by V. A. Yevtushenko, jpp 19-20]

The VK cutter-loader as part of the KNK [not further identified] used for mining coal from thick, steep seams. Installation, special features and operating schedule.

UDC 622.233.05

THE R-1300 REVERSE MOTION EXPANDER

[Synopsis of article by M. S. Baranovskiy, M. S. Tul'man and V. jS. Yermolayev, pp 20-21]

[Text] The design, conditions for use and results of mine tests of the R-1300 reverse motion expander used to widen preliminarily drilled holes of from 500 to 1,300 mm. 1 illustration.

UDC 622.232.8--771.001.4

THE UTTs [not further identified] INSTALLATION FOR INSTALLING MECHANIZED COMPLEXES

[Synopsis of article by Ye. A. Ivonin, V. I. Safonov, A. V. Il'in and I. I. Ivanenko, pp 22-24]

[Text] Technical specifications of the UTTs installation and assembly and disassembly procedures for the 1KM-97D complex. Results of tests in the Stakhanovugol' Association's Annenskaya Mine. Recommendations. 1 table. 5 illustrations.

UDC 622.232.5

PULSATING GIANT WITH PULSED PRESSURE INCREASE

[Synopsis of article by V. G. Timoshenko and V. G. Kravets, pp 24-25]

[Text] Results of mine tests with experimental model of pulsating giant with pulsed pressure increase. Comparison with GMDTs-3. 1 illustration.

UDC 622.625.24:621.869.7

THE MAKING-UP OF THE PS-3.5-900 SECTIONAL TRAIN

[Synopsis of article by A. I. Lesnikov, pp 25-26]

[Text] A method for making-up a sectional train by using additional cars. 2 illustrations.

UDC 622.625.28--752.001.5

INVESTIGATION OF NOISE SOURCES IN ELECTRIC MINING LOCOMOTIVES

[Synopsis of article by Ya. A. Leyman, S. Ye. Chigirinskiy and N. S. Ponomarev, pp 26-27]

[Text] Results of investigation of noise from AM-8D, 2AM-8D and ARP-10-600 ore-hauling locomotive drives. Recommendations on monitoring the manufacturing quality of reduction gears. 2 illustrations.

UDC 622.673.6.004.67

METHODS FOR REPLACING CABLES ON MULTI-CABLE MINE HOISTS WITH FRICTION DRIVE PULLEYS

[Synopsis of article by V. V. Makhinya, pp 28-30]

[Text] Three of the most widely disseminated engineering schemes for replacing cables on multi-cable hoist units. Shows the optimum scheme which employs preliminary suspension of the cables in the shaft. Recommendations. 3 illustrations.

UDC 622.673.1:62--192

CAUSES OF BREAKDOWNS IN EXPLOSION SAFETY CONTROL EQUIPMENT ON MINE HOISTS

[Synopsis of article by V. V. Luk'yanchenko, I. M. Makarov and I. G. Morgachev, pp 30-32]

[Text] Results of tests evaluating the reliability of underground mine hoist equipment.

UDC 621.316.001.24:622.274.526.48

SHIELD UNIT POWER SUPPLY

[Synopsis of article by K. P. Bocharov, Z. M. Rabinovich and B. Ya. Starikov, pp 32-33]

[Text] Calculation of the maximum allowable effective length for a cable system for steep-incline shield unit electric motors. 1 table. 2 references.

UDC 622.232:621.311.153

ELECTRIC POWER CONSUMPTION RATE FOR UNDERGROUND MINING INSTALLATIONS

[Synopsis of article by A. A. Syrovatko and Ye. A. Triller, pp 33-34]

[Text] Analytical expressions and values for the electric power consumption rate for underground coal mine installations. Results of a test using experimental data obtained in a number of Krasnoarmeyskugol' and Selidovugol' association mines. 2 tables.

UDC 622.693.25:624.13.004.67

PROTECTIVE AND DECORATIVE FOLIAGE ON DONBASS WASTE HEAPS

[Synopsis of article by V. I. Baklanov and A. A. Podkopayev, pp 34-36]

[Text] The sanitary and hygienic orientation of recultivating of areas disturbed by coal mine tailings. Recultivation of the land taken up by the waste heap of the Makeyevugol' Association's former No 6/14 Mine.

UDC 66.067.322:622.01

NEW FILTERS FOR LOW-OPERATION THOROUGH MINE WATER PURIFYING UNITS

[Synopsis of article by S. Ya. Petrenko and B. A. Semenenko, pp 36-38]

[Text] Procedures and filters used in thorough, single-stage purification of mechanical and bacterial contaminants from mine waters. Industrial operation of low-operation units used in the thorough purification of waters in the Torezantratsit Association's Ob"yedinennaya Mine. Merits of this procedure and recommendations. 4 illustrations.

UDC 622.807

USE OF FROTH AS A DUST-SUPPRESSION AGENT ON BREAKAGE FACES OF STEEPLY-INCLINING SEAMS

[Synopsis of article by E. N. Medvedev, B. I. Myagkiy and V. S. Dubovoy, pp 39-40]

[Text] Use of froth to suppress dust on steep-seam breakage faces mined with cutter-loaders, shield units and hammer units. SPP [possibly Special Dust-Suppression] equipment. 2 illustrations.

UDC 622.831.322

PREDICTIVE EVALUATION OF MINIMAL DEPTHS AT WHICH OUTBURSTS OF COAL AND GAS OCCUR IN MINES

[Synopsis of article by V. Ye Zabigaylo, V. V. Lukinov and N. G. Zrazhevskaya, p 41]

[Text] Use of the statistical probability approach to determine the minimal depth at which outburst occur. 4 references.

UDC 622.28:622.222.6

STRENGTHENING VERTICAL MINE SHAFTS

[Synopsis of article by Yu. Z. Zaslavskiy, pp 42-43]

[Text] An analysis of the geomechanical situation during installation of vertical mine shafts. Recommendations on ways to improve their system of supports. 1 illustration.

UDC 622.33:543.822

NEW METHOD FOR DETERMINING THE ASH CONTENT OF COAL

[Synopsis of article by N. A. Dobrogorskiy, G. M. Drozdov and M. G. Boldenko, p 44]

[Text] A method for analysing coal to determine ash content by using infrared spectroscopy, which is highly accurate and reduces the time needed for the analysis compared to more familiar methods.

12659
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ALTERNATE FUELS

BRIEFS

SOLAR POWER PLANS--Moscow, 7 Aug (TASS)--All 1,600 huge concave mirrors are ready for work on the Soviet solar power station in the Crimean steppe, not far from the town of Kerchi. In the middle of them is an 89-m tower with water boiler. The automatic device for making each mirror follow the sun and directing the rays onto the boiler has been tested. As they told a TASS correspondent in the Moscow Power Engineering Institute, all the construction work at the station is complete. When the entire system has been regulated, it will start working at its full capacity of 5,000 kW. One should not, of course, talk seriously about the national economic importance of the Crimean station as its energy potential is too small. Moreover, calculations show that one kW will cost about 10 times more here than in ordinary thermal power stations. However, as the specialized equipment becomes cheaper and the capacity of these stations grows, the balance will be redressed. Soviet power engineers are already looking ahead: they have finished a feasibility study for a solar power station on an industrial scale, with a proposed capacity of 300,000 kW. The site chosen is in Uzbekistan. In contrast to the Crimean station, they want to build it with two steam generator systems: one will work on solar energy and the other on natural gas. [Moscow TASS in Russian 1315 GMT 7 Aug 85]

CSO: 1822/339

NUCLEAR POWER

SAFETY PROCEDURES OUTLINED FOR GORKIY AST

PM071606 Moscow KRASNAYA ZVEZDA in Russian 6 Aug 85 Second Edition p 4

[Article by correspondent V. Khrustov under the rubric "We Tell of Komsomol Construction Projects": "Nuclear Boiler House"]

[Text] We city folk are so used to numerous municipal conveniences that we sometimes do not think about how much the hot water for a bath or the warmth from central heating radiators, for example, cost the municipal services. But these things are not cheap. For example, in order to heat a city with a population of 300,000 for a year, it is necessary to burn 500,000-600,000 metric tons of fuel oil in its boiler houses. In many cities natural gas is chiefly used for these purposes.

What could replace organic fuel? Scientists and specialists are unanimous here: nuclear fuel.

As is known, nuclear power is occupying an increasingly important place in the country's fuel and energy balance. Aes's are also called upon to play an important role in resolving the USSR's Energy Program. Today the peaceful atom gives us electricity and desalinates sea water. And tomorrow it will heat large cities.

The first "nuclear boiler house" or, as specialists officially call it, nuclear heat supply station (AST), is being constructed near Gorkiy. I recently visited that shock Komsomol constructive project.

"The warmth and work of our hearts will give people heat"--the construction site greets you with this slogan. This is a busy time there now: Basic work is being carried out on the main block--the safety housing [strakhovochnyy korpus] is being installed in the reactor hall.

"This is an important component of the comprehensive system to ensure the population's safety, with the station being in the immediate vicinity of the city," Yevgeniy Nikitich Kozel, chief engineer of the Gorkiy AST, explained. "Whereas a conventional AES is located 25-40 km from the city which it will supply with electricity, this is inadmissible for AST's: The heat losses in the main heating system are too great, and their construction and servicing are costly."

There are a number of special features in the design of the Gorkiy AST's nuclear plant which make it possible to ensure its reliable operation and safety for the city folk (and, of course, the service personnel). The reactor vessel is housed (after the principle of the Russian matreshka doll) within a hermetic metal safety housing, which ensures reliable conservation of the core in any accident, even including the depressurization [razgermetizatsiya] of the reactor vessel. The three-circuit layout for heating the mains [setevaya] water totally rules out any possibility of a leakage of radioactive products into the heating systems, as the pressure in the second circuit is lower than in the mains circuit. In addition, the energy intensity [energonapryazhennost] of the core in an AST is several times less than in conventional reactors of the water-moderated water-cooled type used in AES's.

The Gorkiy AST is being constructed 8 km from the city. The residential districts of Kuznechikha and Verkhniye Pechory--the chief housing construction site in Gorkiy--are being developed precisely on that side. It is the upland part of the city, with a population of 300,000 people, that the "nuclear boiler house" will supply with heat. Its commissioning at full capacity will make it possible to close down approximately 300 low-power boiler houses burning organic fuel. This will provide a saving of the order of 700,000 metric tons of ideal fuel a year.

A crucial operation--the installation of the heat exchangers of the second and third circuits and the tanks of the emergency reactor shut-down cooling system--has been entrusted to the team of communist labor headed by A. Terin. It employs 24 people, chiefly reserve servicemen. They work to one job schedule. Yuriy Sharagin recently joined the collective. The former tankman quickly mastered the specialty and is now a fourth-grade installation worker. Senior Seaman (Reserve) Petr Kuzmichev and many others are doing shock work to install the safety housing.

And the operatives are learning while construction is taking place. Let this not seem strange. People with the necessary education and experience themselves learn and teach their colleagues everything that has to be tackled in the near future. There is nothing surprising in this, for the Gorkiy AST is the first "nuclear boiler house" in the country.

Engineer-operator Aleksey Kudryavtsev is one of those who will keep an eye on the work of the peaceful atom and monitor the special chemical water treatment system. Despite his youth--he isonly 27--he is a quite experienced specialist: After graduating from Gorkiy Polytehnic he worked for 4 years in a planning organization. Thirty-year-old Valentin Maslennikov is also a graduate of Gorkiy Polytechnic. He is now senior engineer in charge of a unit at the Gorkiy AST.

In a little while the "nuclear boiler house" will supply heat to the houses of the people of Gorkiy. This will be followed by the commissioning of the Voronezh AST. It is also planned to construct similar stations in a number of cities in the European part of the country. In the near future the peaceful atom, which today presents us with electricity, will also give our cities heat.

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NON-NUCLEAR POWER

USSR POWER OFFICIAL DECRIES OBSTACLES TO PLANT RETOOLING

PM021501 Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 1 Aug 85 p 2

[Article by V. Dobrokhotov, chief of the USSR State Committee for Science and Technology power and electrical engineering department under the rubric "Technical Progress: Reserves for Acceleration": "Building As Well As Modernizing"]

[Text] While recognizing the successes achieved by Soviet power engineering, it must be noted that negative trends have also emerged in its development. They are expressed above all in the slowing down of the pace of the electrification of the national economy and of the power-labor ratio growth in industry. The quality of electricity has deteriorated in recent years and supplies to consumers have become less reliable, which is also causing serious concern.

What is the explanation for this situation? One of the main causes is slow retooling and renewal of existing equipment in the sector. As was noted at the CPSU Central Committee conference on questions of accelerating scientific and technical progress, the use of imperfect equipment at thermal power stations is costing us more than 20 million metric tons of standard fuel annually.

Last spring the CPSU Central Committee Politburo discussed a program for the retooling and modernization of USSR Ministry of Power and Electrification thermal power stations for 1986-1990. Two lines of action are envisaged in the sector's modernization. First, the commissioning of the new power stations and heat and electric power stations are under construction in various parts of the country. And, second, the modernization of many existing thermal power stations which have been in operation for a long time.

Naturally, the sector's retooling must be based on the extensive utilization of the latest achievements of science and technology. And for this it is necessary to have done the requisite groundwork as regards the elaboration of progressive solutions and technical studies. Has this been done here? Yes, to a considerable extent. However, another problem is that the translation of these studies into reality is proceeding too slowly to meet needs.

There is no shortage of examples where promising units and installations that have already been developed are not introduced in production for years, through the fault of the Ministry of Power and Electrification. Take, for instance, the highly flexible stand-by power unit designed for Lukomlskaya GRES. That

was almost 10 years ago, and the unit was scheduled for commissioning in the plans for 1980. Then its commissioning was postponed to a later date. And now the building of this important unit has been "put on ice" forever--the design has become obsolete....

The construction of the steam-gas installation at the Novo-Tulskaya TETs is very much behind schedule. The installation for the processing of Kansk-Achinsk brown coal at the Krasnoyarskaya TETs is being mastered extremely slowly. There are excessive delays in the construction of the Zagorskaya pumped storage station which is urgently needed.

I will dwell especially on stand-by equipment. Specialists have tried for years to prove the need for developing this kind of equipment. It is extremely effective during so-called "peak hours"--that is periods of increased electricity consumption--when it helps to deal with acute shortages of electricity. Such equipment has been designed by specialists, but there are obstacles at every step on the path of its introduction.

The Ministry of Power Machine Building, which is supposed to build this equipment, is blaming the USSR Ministry of Power and Electrification, claiming that the latter ministry has failed to submit precise orders. In turn, the Ministry of Power and Electrification is pointing accusingly at the USSR Gosplan, alleging that the latter has made no effort to resolve the question of fuel allocations for stand-by capacities. As a result, there are no plans for the introduction of stand-by steam turbine equipment not only at present but also in the future which, under conditions of the rapid development of nuclear power engineering, may have an adverse effect on the sector's efficiency.

The USSR Ministry of Power and Electrification regularly fails to fulfill the state scientific and technical program targets. Last year the plan for the introduction of new equipment was fulfilled only 79 percent.

In order to resolve the tasks facing the sector, serious reorganization is necessary. Above all, in the administrative echelons. At present several subdivisions are simultaneously dictating the ministry's technical policy, hence the dissipation of resources. This breeds a lack of responsibility on the part of those who implement this policy and leads to delays in the fulfillment of decisions and a slackening of the supervision over the progress of their fulfillment.

I will cite the following example. For more than 5 years now the ministry's subdivisions have tried unsuccessfully to introduce high-voltage equipment with so-called SF6 gas insulation. Compared with installations currently in use, this equipment is more reliable, it requires less space to install, and fewer people to service it. "Give us this equipment, and as quickly as possible," production workers are urging. However, planners refuse to include it in the plans, claiming that it is too expensive. True, the new equipment is still expensive, because so far there are only individual models. In turn, the manufacturers are saying: "Give us big orders, then the cost will go down."

But how can you talk about orders if there are no plans?

And so it goes round in a circle. Neither the consumers, nor the designers, nor the manufacturers have managed to resolve this question because no one has brought their interests together. The USSR Ministry of Power and Electrification Main Design Scientific Research Institute is, unfortunately, coping badly with the role of organizer and coordinator of work in the development and introduction of new equipment.

Receiving requests from various main administrations which deal with new equipment, the ministry's planning and economic administration is in a difficult position sometimes. What has to be done first? What projects are to be regarded as most important, who should be given priority in the allocation of funds? A vivid confirmation of this is the direct current transmission line from Ekibastuz to the center. The construction of this exceptionally important project is dragging on precisely because of errors in the financial policy.

In the major and difficult task of modernization, power industry workers cannot, of course, manage without the assistance of machine builders who will have to reorganize their work bearing in mind the new demands. And these demands are very exacting. It is necessary to almost double the output of equipment for the construction of big capacity nuclear and thermal power stations with 500 and 800 megawatt units, large hydroelectric stations in eastern parts of the country, heat and electric power stations, and power lines of various voltages. It is necessary also to provide equipment for the whole range of reconstruction work on existing stations. And the quality of this equipment must be improved. This applies above all to the welded joints on pipes, stop valves, control valves, instruments, sensors, and control systems. At present these represent the most vulnerable elements in technological systems.

The potential which is at the disposal of our national economy makes it possible to accelerate the sector's retooling so that the highest standard can be achieved in power engineering as regards all indicators. It is merely necessary to make full use of this potential in practical activity.

CSO: 1822/333

NON-NUCLEAR POWER

STATUS OF REPAIR WORK ON VARIOUS POWER STATIONS

[Editorial Report] Moscow Domestic Service in Russian at 0800 GMT on 29 July carries a 6-minute report presented by Boris Lishinskiy on preparing for the winter. He recalls an IZVESTIYA article from 50 years ago in which Kirov officials were criticized for failing to make the proper winter preparations. To this day, unfortunately, such problems recur due to poor management and for this reason, the CPSU Central Committee has set out measures to improve the situation, he says.

Aleksandr Belotserkovets reports from the Ministry of Power and Electrification on Ploshchad Nogina, where for the past 3 months, there have been weekly meetings to discuss winter preparations. Shkondin, head of the industry repair staff, reports that earlier delays have been made up to some extent, but that the repair situation in the Ural Region and West Siberia is still a cause for concern. Repair work has been completed on the fourth set of Troitskaya GRES and it should be put on load soon. Work has also ended on the 10th set of Surgutskaya GRES and the 9th set of Zainskaya GRES. However, due to unexpected additional work, repairs on the first set of Pechorskaya GES is behind schedule. The eighth set of Troitskaya GRES and the seventh set of Zainskaya GRES are soon to be repaired.

Belotserkovskiy then interviews Anatoliy Fedorovich Dyakov, deputy minister of power and electrification, who says that the ministry has learned lessons from the past winter and is now doing everything to ensure that repair work is completed and to prepare thermal power stations for operation. This year, the ministry has improved components' supplies to the power stations, although there is still a lack of some items. The main problem today is a shortage of turbine blades, which is delaying repair work on the rotors of the 9th set at Kostromskaya GRES, Slavyanskaya GRES and (Sevdarinskaya) GRES.

As for fuel supplies, there is concern over Kuznetsk coal for power stations in Siberia, Kazakhstan, the central region, and the Ukraine. There are also problems with supplies of Azeya-Cheremkhovo coal due to the insufficient number of trucks and a shortfall in coal extraction.

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NON-NUCLEAR POWER

COAL ENRICHMENT SEEN AS ALTERNATIVE TO GRES MODERNIZATION

[Editorial Report] An 800-word article by K. Iskakov, director of the Kazakh Power Repair Enterprise and candidate of technical sciences, appears on page 2 of the 17 July 1985 issue of SOTSIALISTICHESKAYA INDUSTRIYA. The article advocates construction of coal enrichment facilities as an alternative to modernizing boilers and pipes, so as to accommodate the higher quantities of ash in Ekibastuz coal. The Ekibastuz GRES-I, recounts the author, was constructed under the presumption that ash content would not exceed 43 percent. Now that ash content is up to 55 percent, boilers and pipes must soon be modernized, and this will cost "from two to nineteen rubles per kilowatt of installed capacity", which would mean that "reconstruction of just this station will cost 40 million rubles. And what about the other stations?" Although three similar power stations are scheduled to be constructed in Ekibastuz, which would bring the power capacity up to 16 million kilowatts, "their prospects are not yet shining" since the USSR Ministry of the Coal Industry apparently did not have the foresight, according to the author, to build the required number of enrichment facilities, trusting instead that the miners would continue to find high-quality coal. The specialists have not yet decided whether "to embark upon the course of coal enrichment or to continually develop new equipment for fuel which is constantly declining in quality".

CSO: 1822/334

ENERGY CONSERVATION

ESTONIAN GOSPLAN LAMENTS ENERGY PLAN UNDERFULFILLMENT

Tallinn SOVETSKAYA ESTONIYA in Russian 8 Jun 85 p 2

[Article by I. Belistov, first deputy chairman of ESSR Gosplan: "A Source of Production Growth; Our Task Is to Operate at Least Two Days on Conserved Raw Materials"]

[Excerpts] Faster increases in raw-material and material production alone cannot ensure further economic growth. The material-intensity and energy-intensity indicators must now be constantly reduced. Therefore, conservation must be transformed from a small addition to the constantly growing pool of resources, as in the past, into the most important source of production growth. And, it is no accident that the country's leading collectives have established important goals, approved by the party, for the 1985 socialist competition: to create funds of above-plan conservation and to operate at least two days on economized materials, raw materials and fuel. This challenge is already being implemented.

This above-plan conservation of material resources was calculated by a special method and, for the republic's industry, totals about 20 million rubles, which matches the republic's socialist obligations.

Enterprises must ensure uninterrupted production on those days when they are operating on conserved resources. Therefore, they must sign agreements which stipulate that the components received from their suppliers also be made from conserved materials and raw materials.

Below the required level, measures are implemented for conserving specific types of material and energy resources. The tasks and socialist obligations are not being satisfactorily fulfilled for the majority of the statistically accounted types of materials, fuels and energy (except gasoline and rolled ferrous metals).

Instead of thermal-energy conservation, overconsumption of 95,500 gigacalories was permitted. The annual obligation for electricity conservation is being fulfilled far behind schedule; for the first quarter, only 2.7 percent of the annual volume was conserved. Fulfillment of the obligations for conserving cement and lumber totaled 12.3 percent and for boiler-furnace fuel, 13.6 percent. It would be appropriate to note

those collectives which permitted significant overconsumptions of resources; the conservation activities (or rather, inactivity) of these collectives were the major cause of the modest results obtained by the republic in the first quarter. These collectives are: for boiler-furnace fuel, the Baltic Railroad's Estonian Division, Estonglavenergo and Estonfosforit; for thermal energy, Agroprom ESSR, Slantsekhim, Estonbumprom and the ESSR Ministry of Light Industry; for electricity, Estonslanets, the ESSR Ministry of the Construction Materials Industry and Estremrybflot; for diesel fuel and gasoline, the ESSR Ministry of Roads and Highways, and for lumber, Estonbumprom.

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CSO: 1822/281

ENERGY CONSERVATION

SPRING SEASON DEMAND FOR ENERGY RESOURCES SURVEYED

Moscow EKONOMICHESKAYA GAZETA in Russian No 20, May 85 p 10; No 21, May 85 p 6; No 25 Jun 85 p 4

[Article by V. Tikhonov; V. Loginov; N. Maliyev, chief of USSR Gosnefteinspektsiya [State Petroleum Inspection Agency], and V. Smirnov: "Energy Resources Must Be Used Efficiently"]

[May 1985 p 10]

[Text] Natural Gas

For the country's gas-supply system, April is a transition month from winter to summer gas consumption levels. This change in consumption requires that production and supply of the fuel be very carefully monitored.

Analysis shows that overall, gas-industry enterprises are successfully coping with this task. For the month, the sector's associations produced over 1.2 billion cubic meters of gas above the planned amount. This fully satisfied consumer demand and allowed the producers to accumulate gas reserves in underground storage areas. Tyumengazprom Association produced the largest above-plan volume of gas. Orenburggazprom and Turkmengazprom Associations and a number of other gas-production enterprises made important contributions to overfulfilling the production plans.

All gas-transport enterprises are providing continuous gas supply to consumers. Most of them, including Zapadtransgaz, Bashtransgaz, Volgogradtransgaz, Stavropol'gazprom and Lentransgaz Associations, have strictly adhered to their supply plans and have not permitted any violations of gas-consumption discipline.

Meanwhile, in a number of cases there were significant deviations from the established gas-supply tasks. For instance, in April the Ukrgazprom Association supplied more gas than planned to consumers in Moldavian SSR and several oblasts in the Ukraine and RSFSR. Surguttransgaz, Tomsktransgaz, Armtransgaz and Aztransgaz Associations, whose gas deliveries were also above the established limits, are not paying

sufficient attention to these problems. In these associations, the monitoring of gas-consumption discipline is poor. They are careless in fuel use and conservation, permitting significant overconsumption by many consumers.

The planning mechanism for natural-gas distribution plays an important role in organizing gas use. In accordance with the existing system, gas deliveries to most consumers are planned quarterly, with the quarterly amounts divided evenly for each month. This leads to a situation where gas-delivery plans for certain months are quite different from the actual consumption.

Thus, in April, the daily gas limits calculated for the second-quarter funds were 33 percent lower than in March for Tajik SSR, Dagestan ASSR and Kharkov Oblast. These limits were 17-28 percent lower in April than March in Belorussian SSR; Uzbek SSR; Udmurt ASSR and Bryansk, Kaluga and several other oblasts. However, the daily fuel demand, which is largely dependent on weather conditions, was nearly the same for each month. As a result, many consumers did not stay within the limits and required gas-supply plan corrections. This leads to violations of the plan basis for fuel use.

All of this confirms the need for a considerable improvement in the planning mechanism for deliveries of gas and other fuels. One of the directions for solving this problem is to expand the differential approach to formulating gas-delivery plans and take into account the changes in weather and other consumer operating conditions when dividing up the monthly limits for this fuel.

Electricity

According to data from operating records, electricity consumption in April was about 600 million kilowatt-hours below the plan. An absolute majority of the country's krays and oblasts, as well as 10 union republics, were within their established limits. The best results were achieved by enterprise collectives in the RSFSR and Ukraine, which have conserved about 700 million kilowatt-hours for the month.

At the same time, in Uzbekistan, Kazakhstan, Georgia, Latvia and Estonia, the actual electricity consumption exceeded the plan task by nearly 300 million kilowatt-hours. Enterprises in Bashkir and Buryat ASSR's and in Astrakhan, Volgograd, Murmansk and several other oblasts finished the month with overconsumptions of electricity.

It is of note that several of the above-named union republics and oblasts have been mentioned before in this weekly. The authors of answers to these articles promised to take the necessary measures and eliminate the indicated shortcomings. Apparently, additional efforts are needed.

As in previous months, all the industrial ministries were, overall, within their prescribed limits. However, about 200 enterprises of those which are monitored daily by energy-inspection agencies had an overconsumption of

more than 150 million kilowatt-hours in April. Among these are 11 enterprises of the Mininstry of the Petroleum Industry, 7 of the USSR Ministry of the Coal Industry, 9 of the Ministry of Tractor and Agricultural Machine Building, 15 of the Ministry of Railways, 6 of the USSR Ministry of the Petroleum Refining and Petrochemical Industry, 9 of the USSR Ministry of Ferrous Metallurgy and 6 of the USSR Ministry of the Construction Materials Industry.

Right now, preparations everywhere are underway at full speed to prepare energy departments for winter. The success of these efforts will largely depend on the quality and thoroughness of planned repairs to power-station equipment and electrical and heat-supply networks. It will also depend on whether the necessary fuel reserves are accumulated.

Meanwhile, the totals from last winter must be analyzed again, and measures taken to improve the system of electricity-consumption management. Measures must also be taken to implement available devices for automating metering of power consumption. At those enterprises and in those organizations which are permitted to use electricity for heating, heat-storage tanks must be put into operation, as well as automatic controls which will turn off the heaters when the daily electrical-system load maximums are exceeded.

Taking into account the shortcomings found last year by energy-inspection agencies in operations of the so-called small-motor consumers, these consumers must be checked in a timely manner as to whether their electricity-consumption limits are properly justified, since it is namely these enterprises which are the main violators of electricity-consumption discipline.

[May 1985 p 6]

[Text] Petroleum Products

In April, USSR Gosnefteinspektsiya checked more than 200 enterprises of a number of ministries and agencies. It was noted that petroleum-product utilization is improving extremely slowly.

It was found, for example, that the Lithuanian SSR Minmyasomolprom [Ministry of the Meat and Dairy Industry] did not give its enterprises their tasks for petroleum-product conservation until the end of February. It is no accident that the plans for organizational and technical measures developed at the Shyaulyay Milk Combine, Alitus and Shyaulyay Meat Combines and the construction-repair adminstration do not ensure the necessary conservation of lubricants. For the first quarter, rather than the expected savings, the enterprises of this ministry overconsumed fuel.

Enterprises of Tajik SSR Minmyasomolprom are carelessly using motor vehicles and fuel. Gasoline coupons are issued to drivers without regard for their remaining fuel, and coupons are given out in quantities which are 3-4 times greater than those required for fulfilling the tasks.

The Collegium of Kazakh SSR Minmyasomolprom, together with the sector trade-union committee, approved a statute with a commitment for the ministry's enterprises to operate at least two days on conserved resources. In reality, up to half of the enterprises checked in April had not received their conservation tasks and practically no work at all was being done in this direction. As yet, no bonus system for petroleum-product conservation has been implemented, while the accounting for equipment operation and fuel consumption is organized so that any amount of "savings" can be written in later.

A number of Mingazprom [Mininstry of the Gas Industry] enterprises have, without any basis, increased their established fuel-consumption norms. S. Kushnarenko, chief engineer of the Nadym Motor-Vehicle Transport Enterprise, Tyumengazprom All-Union Production Association, confirmed that the consumption norms for liquid motor-vehicle fuel for his enterprise were 5-8 liters higher than those established by the USSR State Planning Committee. At the Namangangaz Motor-Vehicle Enterprise, because of elevated consumption norms, an excess 2600 liters of gasoline and 18,500 liters of diesel fuel were written off.

Four months have passed since the beginning of the year. This is long enough for the leaders of the above-named ministries and enterprises to have sternly questioned those responsible for conservation of petroleum products about their lack of action, which has led to squandering of one of the most valuable resources.

[June 1985 p 4]

[Text] Natural Gas

In May, the gas-delivery system switched over to summer operation, characterized by reduced gas consumption in the national economy and increased pumping into underground storage facilities. Consumption of this fuel was more than 100 million cubic meters per day less than in April. At the same time, collectives of Mingazprom enterprises produced 1.3 billion cubic meters of gas above the plan.

An absolute majority of oblasts, krays and autonomous and union republics stayed within their established limits, while only several permitted overconsumption.

Violations of gas-consumption discipline were permitted by enterprises of a number of ministries. Of the 60 plants of the USSR Ministry of the Construction Materials Industry which are being monitored daily for gas consumption, 18 permitted overconsumption; meanwhile, 22 of 91 of the USSR Ministry of Ferrous Metallurgy plants permitted overconsumption. For the USSR Mininistry of Power and Electrification, the above-plan gas consumption in May exceeded 400 million cubic meters. Here, one third of the 235 enterprises did not stay within the established limits. Several sectors are demanding, without any basis, an increase in their

gas-consumption plans; then, after having received the additional resources, they do not use them. This situation in May was observed at several plants of the Ministry of Mineral Fertilizer Production and the USSR Ministry of Ferrous Metallurgy.

Signficant unproductive consumption of gas is occurring in a number of cases because outmoded, uneconomical equipment is still being used and poor use is being made of secondary energy resources. According to data from government gas inspection agencies, for these reasons 4-5 percent of the annual consumption is being wasted. This is primarily due to enterprises of the Ministries of Railways, Light Industry and the Food Industry.

In order to avoid serious difficulties in winter fuel deliveries, preparations must now be made for operation in the fall-winter period of 1985-1986. Maximum use should be made of the summer season to accumulate sufficient reserves of liquid and solid fuel at stockpiles of power plants, heat-supply boiler installations, metallurgical plants, construction-industry enterprises and enterprises of other industrial sectors, as well as in Mingazprom underground storage facilities.

State inspection agencies, people's control posts, energy services and workers' collectives of all enterprises and organizations must direct their efforts toward finding reserves for energy conservation.

Electricity

According to operating data of Gosenergonadzor [State Energy Inspection], the country last month consumed about 1 billion kilowatt-hours of electricity less than the limits. The greatest contribution to the nationwide conservation was made by enterprise collectives in the RSFSR, Ukraine and Belorussia. In 10 other union republics, less electricity was used than called for in the plan. Only Latvia and Azerbaijan permitted overconsumptions of from 0.4 to 1 percent of the prescribed limits.

Meanwhile, it must be noted that in a number of republics, favorable overall results often mask significant operating shortcomings. For instance, enterprises of 8 of the 19 oblasts in Kazakhstan and one third of the oblasts in the Ukraine did not stay within their established electricity limits.

As in previous months, all industrial ministries, overall, remained within their prescribed limits. However, the number of violations of resource-conservation discipline is being reduced slowly. In May, there were 178 violating enterprises (out of the total number being observed daily by Gosenergonadzor agencies). These include 17 plants of the USSR Ministry of Nonferrous Metallurgy, 18 of the USSR Ministry of the Coal Industry and 8 of the Ministry of the Petroleum Industry. These enterprises overconsumed more than 100 million kilowatt-hours of electricity.

Uninterrupted power supply to consumers is possible only when there is unconditional observation of electrical-consumption discipline by all enterprises and in all regions, oblasts and republics.

According to the five-month totals, overconsumption of electricity was permitted in six union republics. According to report data, this is taking place in Latvia, Estonia, Georgia, Ukraine, Uzbekistan and Moldavia.

According to the available report data, for 4 months, 13 ministries and agencies did not stay within their prescribed limits, and overconsumed about 400 million kilowatt-hours. Among these are the USSR Ministry of the Coal Industry, USSR Ministry of the Fruit and Vegetable Industry, USSR Ministry of Land Reclamation and Water Resources, Ministry of Transport Construction, USSR Ministry of Construction and USSR Ministry of Rural Construction.

The greatest number of electrical-consumption discipline violations for the period were permitted by republic-level enterprises and organizations. In 7 union republics (RSFSR, Ukraine, Uzbekistan, Kazakhstan, Kirghizia, Moldavia and Latvia), these enterprises consumed over 1.4 billion kilowatt-hours above their prescribed limits.

As a minimum, the electricity overconsumption permitted since the beginning of the year must be made up during the summer. The opportunity exists everywhere to accomplish this.

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GENERAL

PRAVDA ON NEED FOR PREPARING WINTER FUEL STOCKS

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[Editorial: "Fuel for Winter"]

[Text] Everybody remembers the lessons of last winter when the cold weather took many enterprises and cities in a number of the country's regions unawares. The snowfalls and frost resulted in interruptions in heat and electricity supply and disruptions in the work rhythm of transportation. To this day some enterprises have not been able to make good the omissions in the first quarter. To prevent the repetition of a similar winter in the future, it is necessary to prepare carefully, even now, for the onset of the cold weather.

Towns, villages, and industrial and transport enterprises have begun to implement measures which should create the basis for rhythmic working in the fourth quarter of the current year and for a confident start in the 12th Five-Year Plan. As is known, normal work at this time depends primarily on the country's fuel and energy complex.

One of the most topical tasks--whose solution must not be postponed--is the creation of fuel reserves at thermal power stations, metallurgical and coaltar chemical plants, construction industry enterprises, and also in towns and villages for the population's domestic needs. The USSR Council of Ministers recently adopted a resolution "on Providing the National Economy and the Population with Fuel, Electricity, and Heat Energy in the Fall-Winter Period 1985-1986." In particular this sets specific targets for the USSR Ministry of the Petroleum Industry, the Ministry of the Gas Industry, the USSR Ministry of the Coal Industry, and the USSR Ministry of the Petroleum Refining and Petrochemical Industry for the extraction of oil, gas condensate, coal, and gas, for oil refining, and for fuel oil production in the first quarter of 1986. In order to create fuel reserves, these sectors must work efficiently and successfully right now before the frosts come. However, not everything is yet well in the huge sector of industry producing fuel and energy. The half-yearly targets for oil extraction have not even been fulfilled. On the whole the extractors of natural gas, shale, and coal have worked satisfactorily, but several enterprises, pits, and opencut mines which are failing to cope with the plans are still assimilating production capacities only slowly.

For the umpteenth year in a row now the USDR Ministry of the Coal Industry has failed to meet production targets for coal briquettes for heating residential

blocks. This year too their output target is not being met. Leaders of the coal enterprises, party and trade union committees, and local Soviets must do everything to overcome the lag that has been allowed to occur and to deliver fuel on time, in the right quantity, and of a high quality.

The miners are frequently let down by the railroad workers. Quite recently the coal miners sounded the alarm about a huge accumulation of coal in the Donbass which had not been shifted. This omission has been successfully rectified in the main, but now a similar picture can be observed in the Kuzbass. Through the fault of the Kemerovo railroad, big fuel stocks have built up here, and as a result the deadlines for the stockpiling of fuel for municipal needs are not being observed in many oblasts of the RSFSR and Kazakhstan. The Ministry of Railways must take urgent measures to accelerate the delivery to consumers of this important freight.

Railroad workers must do a considerable amount of work not just to deliver fuel to cities and enterpirses, but also to carefully prepare thier rolling stock, the track facilities, production buildings, and loading and transporting equipment for uninterrupted work this coming winter. The rhythm of the transportation process has been upset too often during the winter cold weather. It is necessary to carefully analyze the lessons of last year and eliminate in advance defects which may become causes of disruptions in the transportation process.

The country's power industry workers must check, without delay, the reliability of boiler equipment, ensure the timely commissioning of new capacities, complete the modernization and repair of power units, and create fuel reserves. Much work is being done along all these avenues, but there are some alarming facts. The modernization of a number of GRES's is being delayed. The Krasnoyarskenergo and Dalenergo power stations are not creating fuel reserves for themselves vigorously enough. Power industry workers have several complaints to make regarding machine builders who are failing to supply assemblies, components, and spares. The issue today is to give a "green light" to orders for the fuel and energy sectors.

As well as increasing electricity output and stepping up extraction of all types of fuel, it is necessary to sharply intensify the policy of thrift in each sector of production. Valuable experience in saving energy resources has been accumulated at many industrial enterprises. Thus, the Severodonetsk "Azot" Production Association (Voroshilovgrad Skaya Oblast) is increasing output without any increase in the overall amount of heat and energy consumption. The plans for saving fuel and energy resources are constantly monitored by commissions of representatives of party and other public organizations, specialists, and leading workers. However, there are several instances of fuel and energy being used wastefully. Big losses are being permitted at enterprises of the light and food industries where, according to data of the state gas inspectorate, up to five percent of the volume of gas consumed annually is being lost. There are several reserves for making savings within the housing and municipal services, which use one-fifth of the country's fuel and energy resources. Much fuel can be saved if domestic and production premises are heated well.

Ministries and departments must strictly monitor work to reduce electricity and heat consumption. The causes of overconsumption of heat and electricity must be eliminated promptly. Party committees and local Soviets are called on to disseminate broadly the experience of leading enterprises in saving fuel and energy and must call strictly to account those who are guilty of a wasteful attitude to national resources. A package of measures regarding the uninterrupted supply of fuel for the population must be implemented in towns, villages, and other population centers, procurement of the necessary amount of local types of fuel must be ensured, and transport and equipment must be allocated for these purposes. Before the onset of the cold weather, the electricity network must be put in order, buildings, installations, and transport must be prepared for work in winter conditions, and measures must be taken to reduce consumption of electricity capacities at peak times.

The period of cold winter weather is not far away. Every collective must prepare itself for work in these conditions, take care to provide itself with a reliable supply of heat and energy, and prevent disruptions in production rhythm.

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